PROCEEDINGS OF A NATIONAL WORKSHOP ON

STATE OF THE ENVIRONMENT REPORTING

October 24-26, 1989, Victoria, British Columbia

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NATIONAL WORKSHOP ON STATE OF THE ENVIRONMENT REPORTING

Executive Summary

British Columbia's Ministry of Environment and Environment Canada co-hosted a very successful federal-provincial-territorial workshop on SOE Reporting in Victoria, B.C. on October 24-26th, 1989. The workshop represented the first multi-lateral forum on SOE reporting in Canada. The thirty-five participants included senior managers and other professionals directly associated with SOE reporting activities in their jurisdictions. Nine provinces, two territories and the federal government were represented.

The objectives of the workshop were to exchange information on SOE reporting activities across Canada and to identify opportunities for future cooperation. A Roundtable status report from each government revealed that involvement in SOE reporting varies across Canada from those jurisdictions which are well advanced to others which are just beginning to establish a program. All held in common a uniformly high degree of interest in and awareness of the subject.

The workshop provided an opportunity for those jurisdictions with a longer tradition in SOE reporting to share their experiences. Invited presentations came from:

- the Environment Directorate of the Organization for Economic Co-operation and Development (OECD) which provided the international context;
- Environment Canada which outlined the federal SOE reporting program;
- Quebec and Atlantic Canada which related their provincial and regional experiences; and
- the Institute for Research on Public Policy which dealt with its recently completed work, in conjunction with the U.S. Conservation Foundation, on the state of the Great Lakes.

Three non-government organization panelists, from the fields of education, industry and environmental interests, provided their perspectives on the direction and expectations of SOE reporting. Highlights included the need to:

- keep SOE reporting simple but scientific; identify key data gaps and fill them; select SOE indicators; incorporate SOE reporting in educational curriculum development; emphasize the interdependence of environment and economy and responsible decision-making; and examine all components of the ecosystem, and especially problems of bioaccumulation and biomagnification.

Two working group sessions addressed elements of SOE reporting in more detail. The first session covered communications and decision-making, analytical tools and methods, and institutional arrangements. This led to a second session which addressed strategies for cooperation. Plenary reports of these sessions stimulated discussion on topics such as: resourcing for SOE reporting activities; the need for a legislated mandate; the importance of SOE reporting in providing benchmark information from which to evaluate trends; the appropriateness of advocacy positions in SOE reports; the need for communications planning at the beginning of the SOE reporting process; and the role of Round Tables on Environment and the Economy.

The final plenary focussed on identifying the next steps to advance SOE reporting and vehicles for follow-up. Several provinces recommended that CCME be briefed on the results of the workshop in order to

achieve greater commitment and recognition for SOE reporting initiatives. CCME was recognized as the best existing forum to provide policy guidance.

During the final plenary, the series of identified next steps were discussed. It was agreed that:

- British Columbia table an executive summary of the workshop proceedings and an outline of the workshop group's next steps with CCME;

- A task group of interested workshop participants be formed within six months to pursue development of indicators for SOE reporting;

- Networking and information exchange on SOE reporting activities continue and task groups on communications, data management, and mechanisms for cooperation be considered;

- Another workshop be held in a year's time to report on further progress in SOE reporting and develop an action plan that identifies needs over the longer term.

Environment Canada agreed to provide the focus for feedback on participant interest in the various task groups and the results of an evaluation survey.

While there was not always consensus, the prevailing attitude at the workshop was a keen interest in SOE reporting, a shared sense of purpose and a willingness to cooperate.

ACKNOWLEDGEMENTS

A committee comprised of Anne Kerr, Peter O'Hara and Terry Chiasson of Environment Canada, and Brian Turner and Gil Soellner of the British Columbia Ministry of Environment was responsible for organizing this first-ever federal-provincial-territorial workshop on State of the Environment Reporting.

Dr. Tony Dorcey, workshop facilitator, Harriet Rueggeberg, proceedings coordinator and rapporteurs Laurie Cooper, Loralee Delbrouck, Julian Griggs, Marion Jamieson, Peter Leighton and Gillian Saxby, all from the University of British Columbia, prepared the first draft of the proceedings.

Jim Garner, consultant, assisted by Anne Kerr and Tom Pierce of Environment Canada edited the proceedings. Tom Pierce was responsible for overseeing the French translation and final production.

Brian Turner coordinated publication of the proceedings, funded by the B.C. Ministry of Environment

The efforts of all the above are acknowledged with gratitude.

Particular thanks go to all the participants whose active involvement and enthusiasm were ultimately responsible for the workshop's success.

I INTRODUCTION

WORKSHOP OBJECTIVES AND STRUCTURE

-- Tony Dorcey, Facilitator

The primary objectives of this workshop, as outlined at the outset by the facilitator, were to exchange information on state of the environment (SOE) reporting and to lay the groundwork for future cooperation in SOE reporting among federal, provincial and territorial governments. The workshop should produce concrete ideas and a sense of commitment, and identify both the opportunities to move ahead (who will do what, when and how) and the constraints to doing so.

The workshop was structured (see Figure 1) to address several key areas of concern: What is SOE reporting? Why and for whom? How do we do it? How can we work together? What future action can we recommend? The program for the workshop was:

- Introductory remarks by the facilitator and representatives of the host governments, Canada and British Columbia.
- Brief reports by each province and territory and by the federal government.
- Presentations on SOE reporting experiences.
- A plenary discussion led by non-government panelists on where SOE reporting is and should be going.
- Workshops on approaches to SOE reporting and strategies for cooperation.
- Plenary sessions after each workshop to present and discuss findings.
- A concluding session to discuss next steps in moving SOE reporting forward.

Tony Dorcey is the Acting Director
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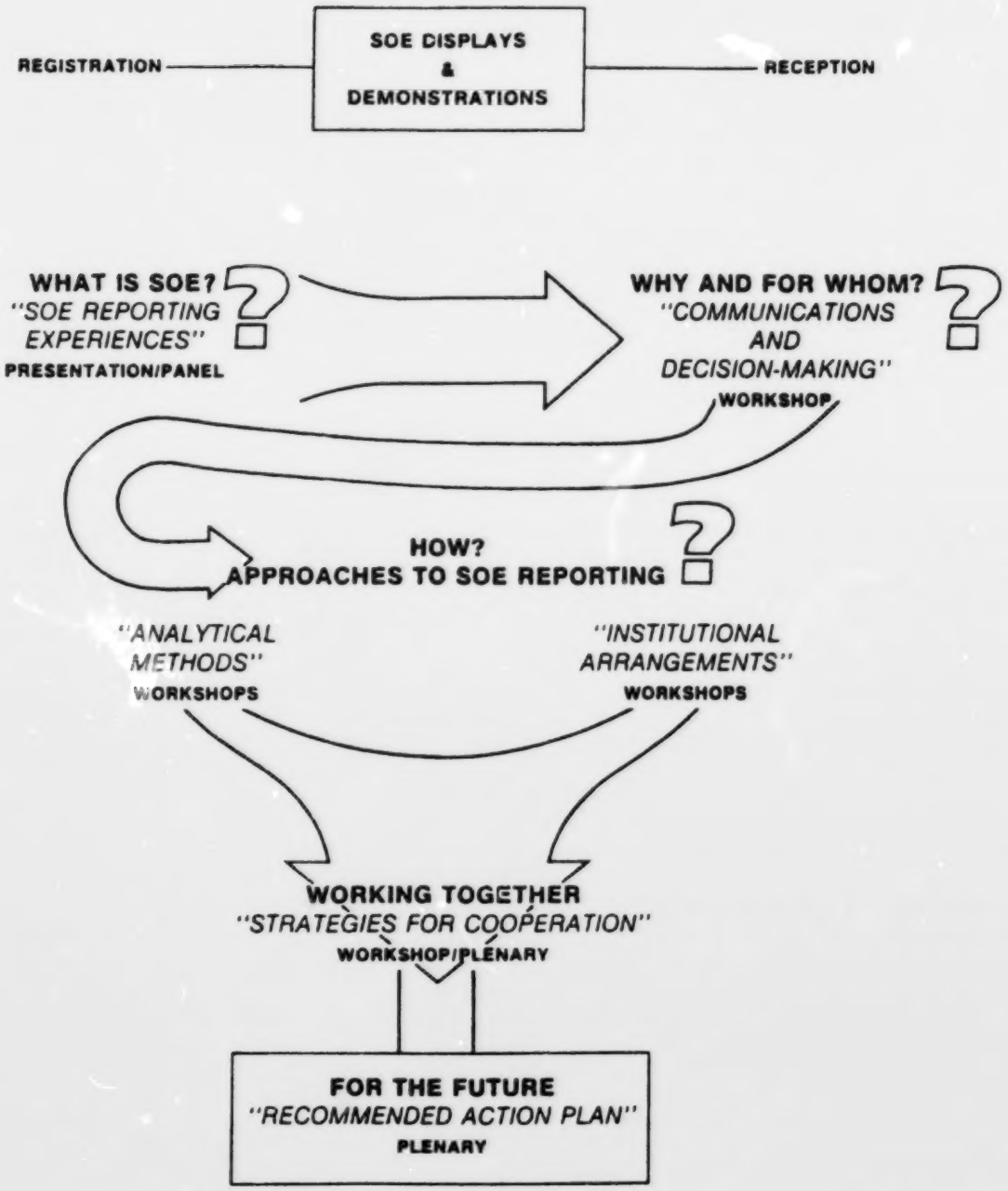
Figure 1 SOE WORKSHOP FRAMEWORK



OPENING REMARKS

Environment Canada -- Leslie Whitby

Leslie Whitby suggested the public is looking to governments for credible, understandable information on environmental conditions and trends. Increasingly, people are demanding better access to better information and greater accountability regarding the state of the environment. That's what SOE reporting is all about.

Federal involvement in SOE reporting began with two researchers in Environment Canada and Statistics Canada. Their efforts culminated in Canada's first SOE report in 1986. In response to public demand, following the release of the 1986 State of the Environment Report for Canada, the federal government set up an SOE reporting system and mandated it under the Environmental Protection Act of 1988. The present plan is to produce a second SOE report for 1991 and subsequent national reports every five years.

Within the federal government, primary responsibility for establishing an SOE reporting system rests with Environment Canada and Statistics Canada. These two departments interact with many different federal ministries. But the federal government cannot act alone in this -- the management of natural resources and the preservation of the environment are shared responsibilities in Canada. Indeed, SOE reporting provides a unique opportunity for all Canadian stakeholders to share the results of efforts on behalf of the environment and thus heighten public awareness of environmental trends, their implications and management responses.

There is at present an opportunity for great strides in SOE reporting in Canada. At no other time has there been such a convergence of points in favour of it -- an incredibly high, sustained level of interest by all sectors of society, a solid mandate, a willingness by other government departments to make the environment a priority, an eagerness by various jurisdictions to cooperate and a genuine interest by industry to participate. We must use this momentum to move forward in SOE reporting; this workshop is a step in the process. It represents a forum in which to learn, exchange ideas and explore opportunities for future cooperation in SOE reporting activities.

One question that the workshop should examine is how to involve others such as industry, environmental groups, business and labour in SOE reporting. They want information, but they also want to be part of the SOE reporting process. What role should the Canadian Council of Ministers of the Environment (CCME) play?

A really big challenge is posed by environmental indicators, a subject raised by the Prime Minister at the recent Economic Summit in Paris. Dr. Whitby forecast a series of national SOE indicators, rather like economic indicators such as the consumer price index, that will give a broad overview of the state of the Canadian environment.

Ultimately the role of SOE reporting is to measure progress toward sustainable development. Information on the patterns and trends of human interaction with the environment and an analysis of its significance are essential for appropriate action toward sustainable development. SOE reporting is critical to devising global environmental policies that lead to sustained use of the environment and its resources.

Leslie Whitby is Director of Sustainable Development and State of the Environment Reporting Branch, Corporate Policy Group, Environment Canada

British Columbia Ministry of Environment
-- John Dick

John Dick described British Columbia's SOE reporting situation as the "law of the retarded lead" -- those most willing to lead are the least able to benefit from their efforts. The corollary, however, is that those who start behind benefit most from the experience of those who went before.

The government of British Columbia is committed to SOE reporting, not just within the Ministry of the Environment, but across the whole environmental function of government. British Columbia's Round Table on the Environment and the Economy has been given responsibility for overseeing SOE reporting. British Columbia is in the beginning stages of SOE reporting and is looking forward to learning and exchanging ideas on techniques, institutional arrangements and public involvement in this workshop. One goal is to develop a consensus on national cooperation.

Mr. Dick welcomed participants on behalf of both governments and acknowledged the role of the organizing committee in bringing about this workshop.

John Dick is Director, Sustainable Development and Corporate Policy Branch British Columbia Ministry of Environment

II STATUS OF SOE REPORTING ACROSS CANADA

In a round-table discussion, representatives for the provincial, territorial and federal governments (except Saskatchewan) gave brief summaries of current or proposed SOE activities in their jurisdictions and answered questions. These are summarized below.

British Columbia

British Columbia's interest in SOE reporting was sparked by the report of the National Task Force on Environment and Economy. An indication of this interest was the presence at this workshop of observers from the provincial Ministries of Health, Agriculture and Forestry and from the Premier's office.

In mid-1988 the province considered whether its environmental data systems would be useful in SOE reporting, and in September that year held a small workshop at which federal personnel discussed SOE reporting with staff members of the Ministry of Environment and other ministries. The workshop also discussed the need for policy and technical representatives from federal, provincial and territorial jurisdictions to meet, share experiences and coordinate activities.

B.C. has contributed funding, with Environment Canada, to a regional case study on the Lower Fraser Basin, which will form a chapter in the 1991 national SOE report. The effort showed deficiencies in inventory and monitoring information, raised the interest level of other federal and provincial agencies, facilitated inter-agency contacts and led to the formation of a B.C. Ministry of Environment SOE Committee. This Committee proposed in April 1989 that SOE reporting could be used in public education, in program evaluation, as a management tool and as the basis for a formal report to the legislature.

Subsequently the SOE Committee was directed by the Ministry Program Directors Committee to produce an SOE report by mid-1991 with public education as its major objective. However, at this point it seems the scope of the report will be limited to the mandate of the Ministry – recreational fisheries, wildlife, water quantity and quality, air quality, pesticides and waste management. The more holistic issues of ecosystem health are frustrated by the blurring of responsibilities spread by fragmented legislation over different ministries.

The province's Task Force on Environment and Economy produced a report to Cabinet in June 1989. Recommendations included formation of a provincial Round Table with staff support that would be responsible for a Sustainable Development Strategy integrating economic, social and environmental goals and that would oversee regular SOE reporting across the environmental function of government.

It was not clear what the relationship would be between the Sustainable Development Strategy and SOE reporting; the assumption is that SOE reporting would measure sustainable development progress just as socio-economic indicators measure economic progress.

The Round Table has not yet been appointed, and the role of the Ministry's SOE reporting unit with respect to the Round Table's SOE mandate remains uncertain. In the meantime, the Ministry's SOE Committee will define environmental indicators and relate them to present information systems. This experience will be of help to other Ministries once the Round Table SOE reporting system gets underway.

British Columbia is in a learning phase. The province is examining the limits of available data and in its 1991 report will recommend refinements in the collection of data.

Alberta

There is no formal SOE procedure in Alberta. However, the amount of information given the public by the government is increasing -- a process fostered by the Minister of the Environment and the media. Senior public service managers are committed to state of the environment reporting, and, as a report published 18 months previously made clear, its feasibility is under review.

Alberta officials have reviewed SOE reports from elsewhere in Canada and abroad and are considering a "rotating focus" where reports would focus on regions or topics in a three- to five-year cycle.

Alberta seeks answers to some questions about SOE documents:

- What should be their scope?
- Are the reports the work solely of environmental departments?
- What should be their timing?
- What are the measures or yardsticks to be used; should these be uniform across Canada?
- What are the relative roles and responsibilities of individuals and federal and provincial governments?

Manitoba

Manitoba's 1988 Environment Act requires the Minister to produce an SOE report by March 31, 1991 and then every two years thereafter. The SOE coordinating unit responsible for report preparation was, in fact, not formed until 1989 and thus a full year was lost. The report will be tabled in the legislature if it is in session; otherwise it will be circulated within six weeks of its receipt by the Minister. The target audience has been identified as members of the legislature, the educational and corporate communities and the public generally.

Current status of SOE reporting: The Cabinet Planning Committee has appointed a Technical Advisory Committee with senior representatives from 11 departments or agencies and the Manitoba Round Table on Environment and Economy. From May to August 1989, Manitoba had been developing concepts and perceptions in consultation with the federal SOE Reporting Branch. Invaluable insights were gained from the federal experience.

The Manitoba unit has, with some difficulty, drawn up a table of contents for the 1991 report. Three workshops for authors from participating departments have been planned. The first workshop was to deal with the six major topics of the forthcoming report -- atmospheric resources, terrestial resources, economics, population and settlement, waste management and water resources. These topics coincide with the disciplines within Manitoba Environment. The remaining two workshops are scheduled for November 1989 and February 1990.

Final drafts for the first SOE report are due at the end of March 1990. Nine months have been allowed for editing and two for printing, enabling publication by March 31, 1991.

Ontario

Ontario is not formally involved in SOE reporting and is at this workshop to learn. The province has completed an environmental scan as part of its strategic planning process, and this provides the Ministry with a good reading of the environment. The scan seeks to identify the key environmental issues that the Ministry will face in the next 10 years,

and SOE reporting could be an important complementary tool to this end.

Quebec

The Quebec Ministry of the Environment has been interested in SOE reporting for many years, but other agencies have also pursued this kind of approach. For example, the Community Health Department produced a report explaining environmental issues, and the Quebec Union for the Preservation of Nature has published four sectoral reports. There is no legislated mandate for SOE reporting in Quebec, but the Minister sees a moral duty to report to the public on the state of the environment.

The province published its first SOE report in 1988 and the available copies disappeared quickly; yet still there were complaints by interested parties that they had either not seen or not been aware of the report. This leads to the question: how can we ensure that these reports become working tools for decision makers? Quebec is trying to find better ways to transfer information to decision makers.

Quebec is currently working on its 1992 report. A framework is being developed and exchanges between the public and various partners encouraged, thus enabling needs to be more clearly defined. It is clear that the public wants ready access to data; it is also clear the public wants to know what the government is doing to cause regular improvements. Accordingly, annual reports are under consideration, although "global" reports would continue to be issued every three-to-five years. These would allow stresses to be appreciated and would highlight environmental responses to intervention.

After examining a number of reports, officials were astonished by the variety of formats, indices and other parameters used. This leads to several questions:

- Do SOE reports have the same objectives and do they fulfil them?
- Who is the clientele?
- Are the reports complete and do they respond to the questions posed?

New Brunswick

New Brunswick took part in the Atlantic Region report prepared by the regional office of Environment Canada.

Unfortunately, there has been no progress in provincial SOE reporting, although it has been an explicit objective in the Ministry's strategic plan for at least three years. Repeated requests for the funds to finance a third-party body (an environmental council or the provincial Round Table) that could prepare an SOE report have been unsuccessful. None the less, there could well be a better reaction to the next budget request. The Premier's Round Table on Environment and Economy is more aware of environmental issues, and the government feels the need to improve its image in this respect.

Questions from New Brunswick about SOE reporting include:

- Should the SOE report be written by a third party?
- What indicators should be selected?
- To what extent should the public take part in deciding on the indicators and other important elements of the SOE report?

Nova Scotia

Nova Scotia, having taken part in the Atlantic Region SOE report, decided on two ways to augment that effort. First, the Nova Scotia Round Table on Environment and Economy would produce year-end reports on sustainable development initiatives and their impact on the quality of the environment. Second, the province would hold a series of workshops on resource sectors. These would include

scientific papers of a professional quality, which would be published. There were three reasons for this approach:

First, an opinion survey showed that the public sought issue-oriented reports and greater access to officials, and that general publications needed to be made available. Second, public values are the key to success; scientific data are important but must be related to the public. Third, an action framework is needed that involves individuals and non-governmental organizations. These should be encouraged to help in environmental reporting.

In response to a question from the floor: it is possible that the public does not understand fully the concept of SOE reporting; for instance there was no question in the survey about how people get environmental information at present. To this end, the province proposes to hold public workshops over the next three years.

Newfoundland

Newfoundland has not yet begun SOE reporting, although the government has been asked to form a Round Table on the Environment in the next fiscal year. Because of Newfoundland's large size and limited financial resources, the likely approach to SOE reporting would be to concentrate on small geographic areas and particular issues.

Questions from Newfoundland include:

- How do we ensure data collected are reliable?
- How do we involve other groups and departments?
- What are the responsibilities of agencies outside government?

Prince Edward Island

Prince Edward Island is taking part in the Atlantic Region's 1990 SOE report but has not itself undertaken SOE reporting, although it is keen to establish a partnership with Environment Canada to produce provincial SOE reports. P.E.I. suggested that any future environmental agreements between federal and provincial governments should mandate SOE reporting.

The province's new conservation strategy provides a basis for SOE reporting. Core committees of the conservation strategy include agriculture, forestry, transportation, and communication. The reports of these committees will form the first stage of SOE reporting, which may encourage more expanded reporting.

There seems to be some justification for SOE reporting at both federal and provincial levels in that there are different needs for different levels of decision-making. A national report presents a good image, but the information may be too diluted for use at the provincial/regional level.

Northwest Territories

The Government of the Northwest Territories does not yet have an SOE reporting program, but related initiatives are under way. In May 1989, the N.W.T. Executive Council endorsed a draft policy on development, and a discussion paper on the policy has been sent out to 300 interested parties. Goals of the policy are:

- To promote an integrated approach to resource management.
- To maintain and enhance the quality of the environment.
- To establish regional conservation areas.
- To compile an inventory of non-renewable resources.

- To cooperate in the use of transboundary resources.

The policy should be finally determined by spring 1990 and would provide the context for SOE reporting.

SOE reporting is particularly important in the management of renewable resources, because these are the base on which the subsistence economy of N.W.T. rests. SOE reporting is part of the work plan of the territorial Department of Renewable Resources, which is preparing a submission to ask for the funds and authority to proceed with it.

Particular concerns of N.W.T. include:

- The practical value of SOE reporting.
- How to communicate results to a culturally and ethnically diverse community.
- How traditional knowledge can be used as environmental data.

Yukon

There is a mandate for SOE reporting in the Yukon Economic Strategy and the Conservation Strategy. Under these strategies a working committee is developing a framework for a Council on the Environment and Economy, which would be a cooperative body between the Yukon and federal governments. The Council would issue annual reports; SOE reports every five years would enable progress toward sustainable development to be measured.

Indicators to be used within the Economic Strategy include income and employment data; environmental indicators may be added.

Key points and concerns for Yukon are:

- The importance of links with national and provincial governments to enhance the learning process.
- Format of data collection; can minor adjustments be made either to what has already been collected or to collection methodologies? The territory cannot afford to start a new data collection system.
- The feasibility of SOE reporting, given the territory's financial resources.

Stemming from the above, it may be more pertinent to have regional or sectoral reports than to have SOE reports for the whole territory. A number of Regional Planning Commissions are existing or proposed, and these will produce regional plans. The information from these plans could be used as a baseline for regional SOE reporting. In reply to questions, Yukon is still examining the feasibility of using territorial integrated economic accounts. The Yukon Round Table on Environment and Economy will incorporate non-government organizations (NGOs) and therefore will be an important link between government and public interests.

Canada

The 1986 SOE report for Canada was largely the work of two authors from Statistics Canada and Environment Canada who pushed the system from personal commitment, overcoming resistance from scientists and bureaucrats. The process included use of personal contacts, personal knowledge, contract money for particular expertise and an external review process.

Several lessons were learned. A legislative basis is important. SOE reporting can be carried out as a small or large project (in this respect, the 1991 report will provide a good contrast to that of 1986). And it is important to establish credibility -- for instance, the Stakeholder Group on Environmental Reporting recommended against having regulators reporting on what they are regulating. A public advisory committee, the Group said, would "keep the bureaucrats honest."

As the federal SOE program activities were to be described in a later presentation, this status report dealt mainly with Statistics Canada's special role.

Statistics Canada contributes to SOE reports through the collection and dissemination of environment-related socio-economic data. SOE reports are evaluative -- even speculative -- so it is important to put the data before the users; indeed many users say this is all they want. Thus, the 1986 SOE report was accompanied by a statistical compendium: Human Activity and the Environment.

It is important to relate socio-economic data to environmental statistics to provide a picture of human stresses and environmental responses. Hence the importance of including such information as where people live, where industry is concentrated and what are the practices and inputs of agriculture, for example.

Research is moving into resource and environment accounts as adjuncts to the National Economic Accounts. This is an important step in integrating environment and economics, one that interests the Economic Council of Canada and the Treasury Board.

In following discussion, Environment Canada provided details of resources employed to produce reports. For example, the Environmental Analyses and Reporting Group has six officers involved full time in writing and coordinating the input of other departments for the National report. The 1986 5-year report cost approximately $750 000 to research, prepare, publish and distribute. The cost of producing a report in Health and Welfare Canada similar to the 1991 SOE report is expected to be about $500 000.

The federal Sustainable Development/SOE Reporting Branch has 60 people, of whom 20 run the Geographical Information System. Eight people work in the Environmental Analyses and Reporting Division which produces the 1991 report, fact sheets and special reports. The Scientific Methods group has six people and Sustainable Development has 25.

The Great Lakes report cost a total of $750 000 and involved six researchers over two years. The final release process -- press conference, publicity and follow-up -- cost $35 000. The Atlantic Region's 1985 SOE report cost $30 000 including printing, and the 1991 report will cost $75 000.

General Discussion

The involvement of the public was a question raised by several participants. One person suggested that it is one thing to identify what the client wants, but quite another to identify what is actually needed. The experts in the civil service should work with the public to define needs.

The timing of reports affects the perception of improvement or degradation. Short-term fluctuations can appear as degradation, even though the long-term trend is toward improvement. Does not this call for two sets of information, a long-term overview and yearly incremental reporting?

A response to this was that many audiences are asking only for information. The public may be uninformed, but some individuals, including members of environmental groups, have a very sophisticated understanding of the state of the environment. The situation is not black and white; officials often are dealing with a very informed public.

The Lower Fraser River case study for the 1991 National SOE report is to be pitched at a Grade-12 level audience, but officials have been continually surprised at the high level of questions posed by schoolchildren and their teachers; possibly sights should be raised.

This led to two further observations: first, that SOE reporting is not just a single 5-year National report. For instance, Environment Canada's first major effort was the inaugural 5-year National Report, of which 7000 copies were distributed. In addition, 60 000 copies of the summary overview were

disseminated and the Minister's report card was released.

Effectively, this is a process, not a single document, further augmented by ongoing fact sheets, special reports, newsletters, creation of a database/referral system, indicator development, etc. The second observation (from Alberta) was that a single technical report has never been found adequate for the need. There is merit in a series of reports at different levels of sophistication -- especially as much of the public has little clear understanding of SOE reporting.

Participants also discussed whether to have national and provincial SOE reporting or whether to concentrate resources on a national report. One observation was that it should not be an either/or decision but depends on the ecosystem scale concerned. For example, the appropriate scale for air pollutant reporting is likely national, whereas other issues require local treatment.

TABLE I COMPARATIVE TABLE OF SELECTED REPORTS ON THE STATE OF THE ENVIRONMENT

	Content					Production Process			Presentation, Distribution			
	Dates of Publication	Frequency	Structure	Time Trends	Geographical Coverage	Statistical Yearbook	Main Producing Agency	Basic Report	Executive Summary	Illustrated Summarized Version	Number of Copies	Language
United States	Yearly 1970-1986	1 year	Issues	Yes	National (Global)	1979 + Annex to Report	CEQ	400 p.	Yes	No	About 30,000	English
Japan	Yearly 1969-1989	1 year	Pressures State Responses Issues (85-89)	Yes	National (Global)	Yearly 1973-1988	Environment Agency	310 p.	No	Yes	13,600 2,600	Japanese English
France	1978 Yearly 1980-1988	1 year	Pressures State Responses (80) Issues (81/88)	Yes	National (Global)	1974 1978 1982 + Annex to Report	Environment Ministry	348 p.	No	No	3,000 (1981-1988)	French English
Sweden	1979 1982 1987	Not specified	Pressures State Responses (79) Issues (82/87)	Yes	National	1975 1976 1977 1979 1981 1984 1987	Environment Administration	400 p.	No	No		Swedish
Portugal	1987 1988 1989	1 year	Pressures State	Yes	National	1987 1988	Environment Ministry	200 p.	Yes	No		Portuguese
OECD	1979 1985 1991	6 years	Pressures State Responses	Yes	International	1984 1985 1987 1989	OECD Secretariat	250 p.	Yes	Yes	7,000 3,000	English French

TABLE II SOE REPORTING: SUMMARY BY JURISDICTION

Government	SOE Reports		Period	Approach	Issues Identified
	Complete	Future			
Canada National	1986	1991	Every 5 years	- Limited authorship with contract help (1986) - Cooperative Environment Canada and Statistics Canada - Broad federal base with outside support (1991) - Greater role of provinces, NGOs, public, etc. (1996)	- Scepticism from scientists and bureaucracy (1986) - Regulators reporting on own work - Legislated mandate - Indicators
Atlantic	1980, 1985	1990	Every 5 years	- Environmental quality and protection emphasis (1980) - Greater consultation with provinces, NGOs (1985) - Broad scope to include sectoral aspects (1990)	
Alberta	No	Yes	3-5 year cycles	- Focus on geographical areas or specific topics	- Scope? Env. dept. only? - Timing frequency? Measures? - roles of government (fed/prov), industry, NGOs
British Columbia	No	MOE report by 1991	?	- Cooperation with federal government (Lower Fraser case study) - MOE report focus on public education	- MOE report link to Round Table SOE - Fragmentation of environmental mandate among departments - Data/organization limitations
Manitoba	No	1991	1st due March 1991 every 2 years thereafter	- Legislated mandate - Technical advisory committee - Workshops for contributors - Provincial scope	- Format and spatial framework - Communications strategy - Environmental indicators - Public advisory approach - By-products of main report - Database, integration of data

TABLE II SOE REPORTING: SUMMARY BY JURISDICTION (Cont'd)

Government	SOE Reports: Complete	SOE Reports: Future	Period	Approach	Issues Identified
New Brunswick	No	No (participant in Atlantic Region report)	N/A	- Possible 3rd party "Environmental Council"	- Objective, credible reporting - 3rd party vs government approach - Public debate re indicators at early stage
Newfoundland	No	No	N/A	- Use descrete geopraphical units - Round Table in 1990?	- Reliability of data - Involvement of other groups - Relationship to other government agencies
Northwest Territories	No	Yes	Unknown	- Link to sustainable development policy	- Practical value of SOE reporting - Communication to diverse citizenry - Use of traditional knowledge
Nova Scotia	No	Of sorts (also participant in Atlantic Region report)	N/A	- Reliance on issue-focussed workshops and possible SOE conference	- Integration of public values and concerns - Public preference for issue orientation
Ontario	No	No	N/A	- "Environmental scan" as possible precursor	- Complementarity to strategic planning
Prince Edward Island	No	No (participant in Atlantic Region report)	N/A	- Conservation strategy basis - Partnership with Environment Canada - SOE clauses in agreements	- National/provincial/regional scales - Practical level of detail
Quebec	1988	1992	5 year and possible annual	- Variety of formats under review	- Myriad of formats, parameters, objectives, clientele - Reports meet objectives? Used by decision makers? - Thorough distribution
Yukon	No	Yes - in Economic Strategy commitment	Every 5 years	- Environment and economic working group to design report format	- Cooperation with federal government - Limited resources - Regional scale - Useability of existing data/format

III EXPERIENCES IN SOE REPORTING

Representatives from selected jurisdictions and organizations with SOE reporting experience were invited to make 20-minute presentations to the workshop, which were followed by five to 10 minutes of questions. A panel discussion followed between three guests representing different non-government interest perspectives.

Each had 10 minutes to comment on the presentations before discussion was opened to all participants.

The text of the presentations follows.

THE INTERNATIONAL SCENE
"Reporting on the State of the Environment, A Review of the Experience in OECD Countries"
Christian P. Avérous*

Abstract

In 1979, OECD Environment Ministers recommended that member-countries and the OECD itself should publish regular SOE reports. Since then, almost all OECD countries have done so, although fewer have established periodic reporting. The OECD published reports in 1979 and 1985 and plans another for 1991. Non-OECD countries have published reports, as have United Nations agencies and international NGOs.

In the 1990s there will be a need to reassess environmental monitoring, improve knowledge of natural resources stocks, provide more economic-environmental data and, most important, work on environmental indicators.

Sufficient expertise has been accumulated to be clear about the aims of SOE reports and to improve their preparation and content. Concern with sustainable development, nationally and internationally, calls for a reassessment of economic and environmental interactions. The public today has a heightened concern with major technological hazards, global problems and natural resource management under economic and demographic pressures.

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* The views expressed in this document are those of the author and do not necessarily reflect those of OECD.

Reporting on the State of the Environment

This paper reviews the experience in Organization for Economic Co-operation and Development (OECD) countries concerning reports on the state of the environment. It reviews in particular their purposes, content and production process, and their presentation and distribution.

During the 1970s, reports on the state of the environment were published in various countries, following the pioneering annual reports of Japan and the United States. In the 1980s almost all OECD countries have published such a report;[1] however, not as many have established reporting as a periodic activity.

At the international level, Ministers of the Environment of OECD Member countries meeting in Paris in 1979 examined the first international report on the state of the environment and approved a recommendation that every OECD Member country, and also OECD itself, should publish regular reports on the state of the environment.[2] This was the beginning of an on-going process whereby traditional reports on the economic or energy situations were supplemented by reports on the environmental situations. The OECD published its second report for the OECD 1985 Ministerial meeting, and is planning its third one for the OECD 1991 Ministerial meeting. Related statistical publications were produced in 1985, 1987 and 1989.[3]

Beyond the OECD area, reporting on the state of the environment has developed in the 1980s in a number of countries, and in the United Nations system (UNEP, FAO, ESCAP), and in such non-governmental organizations as the World Resources Institute.

What Purpose Does Such Reporting Serve?

This process began in response to three major necessities. In the first place, once governments became seriously concerned with defining and implementing environmental policies, relying on what were often new institutions, laws and regulations, the effect of these policies upon the state of the environment needed to be assessed. Assessing the state of the environment has become a prerequisite for assessing environmental policies and making them more effective.

Secondly, the state of the environment depends not only on environmental policies, but also on economic pressures exerted by agriculture, industry, energy, transport and urban development. Given the wish to integrate environmental concerns more effectively into sectoral policies, assessing the state of the environment can contribute to a basic understanding of the sustainability of economic development.

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1) Australian, Japan*, Canada, United States, and in Europe: Austria, Denmark, Finland, France*, Germany, Ireland, Italy, the Netherlands, Portugal*, Spain*, Sweden, Yugoslavia, as well as the European Community. Countries with a * publish yearly reports.

2) See annexed OECD Council Recommendation C(79)114.

3) OECD (1979) "The State of the Environment", OECD, Paris.
OECD (1985) "The State of the Environment", OECD, Paris.
OECD (1985, 87, 89) "OECD Environmental Data", OECD, Paris.
OECD has also published reports reviewing the national environmental policies of Sweden, Japan, New Zealand, Greece, Yugoslavia and Finland.

FIGURE 1. AUDIENCES, AIMES AND OBJECTIVES OF THE OECD STATE OF THE ENVIRONMENT REPORTS

AUDIENCE
Environmental Administrations
Governmental Decision-making Bodies
The Public
AIMS
IMPROVE ENVIRONMENTAL POLICIES
INTEGRATE ENVIRONMENT IN DECISION-MAKING
INFORM THE PUBLIC
OBJECTIVES
Improve Information Base for Environment Committee
Support Improvement of Information Base in Member Countries
Reinforce Observer Function of OECD
Provide International Information on the Environment for Member Countries
Improve Public Information on International Trends
Support Improvement In Public Information on National Trends in Member Countries

Thirdly, the environment, receiving extensive media coverage, became a topic for public discussion. It was a matter requiring not only action by government, but also by business and households. Better assessment of the state of the environment, based on factual, scientific and quantitative information, has become a necessary condition for democratic debate on environmental issues.

The three major aims for reports on the state of the environment can therefore be summarized as follows (Figure 1):

i) to improve our understanding of the state of the environment and its development over time, in order to evaluate more accurately the results of past actions and the problems to be addressed by environmental policies;

ii) to incorporate environmental considerations more fully into general economic and sectorial decision-making processes, so as to be in a better position to ensure sustainable economic development;

iii) to improve public understanding about the state of the environment, in the interests of a better informed democratic debate about it.

In fact, all these aims have emerged gradually. Reports on the state of the environment were originally produced with one or more of them particularly in mind. Today, too, reports tend to emphasize one or more of these aims. The Japanese report, for example, stresses the improvement of environmental policies in the context of parliamentary discussion for implementing the environment budget; significantly the Japanese Parliament itself took the initiative in 1967 of adding a clause to the proposed pollution control legislation, requiring the Government to publish a report on environment policy every year. Reports in the United States and France emphasize providing regular information for the public. The American report, required by law, is presented by the President to Congress. Another report was published three times by the Conservation Foundation in the 1980s. The French report is presented by the Ministry of the Environment to the Government. For countries with a markedly federal character the reports do, or can, provide an opportunity for both national and sub-national assessment.[1] Ideally, perhaps, all these reports could strike a better balance between the three aims identified above. In the years ahead, the second aim should attract more attention than in the past.

What Should State of the Environment Reports Include?

In the first place, the reports should assess, not only the state of the environment itself, but also the economic pressures exerted on it and the response of administrations, households and firms to those pressures. This is because changes in the state of the environment are the net result of these pressures and responses. A number of reports (Canada, Italy, Portugal, Sweden, OECD) have explicitly adopted this pattern; the Japanese report has evolved by including, in the 1980 version, chapters on human activities exerting an impact on the environment; the United States reports are organized in terms of major issues but retain a similar approach (Table 1).

It is also important to examine changes in the state of the environment with the passage of time: to analyze past and current changes and to identify short and medium-term future developments. This should make it possible to assess the outcome of policies implemented in the past and to identify remaining or new environmental problems requiring attention. The question arises, however, as to how frequently such reports should be produced: an approach in terms of major themes is more flexible and better adapted to an annual report; but the way in which

1) This is the case in the Federal Republic of Germany, Australia, Canada and Yugoslavia.

TABLE I COMPARATIVE TABLE OF SELECTED REPORTS ON THE STATE OF THE ENVIRONMENT

	Content					Production Process			Presentation, Distribution			
	Dates of Publication	Frequency	Structure	Time Trends	Geographical Coverage	Statistical Yearbook	Main Producing Agency	Basic Report	Executive Summary	Illustrated Summarized Version	Number of Copies	Language
United States	Yearly 1970-1986	1 year	Issues	Yes	National (Global)	1979 + Annex to Report	CEQ	400 p.	Yes	No	About 30,000	English
Japan	Yearly 1969-1989	1 year	Pressures State Responses Issues (85-89)	Yes	National (Global)	Yearly 1973-1988	Environment Agency	310 p.	No	Yes	13,600 2,600	Japanese English
France	1978 Yearly 1960-1988	1 year	Pressures State Responses (80) Issues (81/88)	Yes	National (Global)	1974 1978 1982 + Annex to Report	Environment Ministry	348 p.	No	No	3,000 (1981-1988)	French English
Sweden	1979 1982 1987	Not specified	Pressures State Responses (79) Issues (82/87)	Yes	National	1975 1976 1977 1979 1981 1984 1987	Environment Administration	400 p.	No	No		Swedish
Portugal	1987 1988 1989	1 year	Pressures State	Yes	National	1987 1988	Environment Ministry	200 p.	Yes	No		Portuguese
OECD	1979 1985 1991	6 years	Pressures State Responses	Yes	International	1984 1985 1987 1989	OECD Secretariat	250 p.	Yes	Yes	7,000 3,000	English French

the state of the environment, environmental policies and economic pressures fit together only becomes fully evident with a pressure-state-response approach, not easily amenable to a yearly treatment. A combined approach seems desirable with partial thematic annual reports and comprehensive reports every few years. The Netherlands has recently started publishing reports on the future state of the environment using much modelling, as well as other forecasting techniques; this is quite a new approach, focusing on the future state.

The concept of "environment" usually refers to its main components, i.e. air, water, land, living resources and the relationships between them. The earlier reports were mainly concerned with pollution, whereas the more recent ones try to put that concern in a broader perspective of quality of life and management of natural resources. This applies, for example, to the French and Japanese reports. The Japanese report changed its name after three years of publication: the annual report of pollution became the white paper on the environment, when the Environment Agency was established. Consequently, improving the quality of human life, especially health and the man-made environment, and prudently managing natural resources from an economic and ecological point of view, are the essential criteria for evaluating the state of air, water, land and living resources (Figure 2). The short-term perspective is more and more supplemented by a longer term one relating to the concept of sustainability.

The content of the reports on the state of the environment vary with their geographical coverage -- local, regional, national or international. Local reports will contain a more micro-environmental analysis while the national reports will of course focus on the country's territory, but may benefit from the availability of regional and local reports. In the Federal Republic of Germany there are also reports on the state of the environment in the States (Länder), and in Japan there are reports from prefectures. It is desirable, moreover, to put the situation of the country into its more international context. Progress has been achieved along these lines in recent national reports, especially the ones from Japan, the US, and the Netherlands, but largely depends on international co-operation in harmonizing environmental statistics and preparing international reports. It becomes especially important in the light of the growing awareness of the international and global nature of many environmental problems, and of their economic and diplomatic implications.

In the 1980s progress has been made in many Member countries with environmental information as part of a dynamic process centered around the improved collection, treatment and analysis of environmental statistics. Compendia of environmental data are published more or less regularly in most countries (Canada, US, Japan, Australia, Austria, Finland, Germany, France, Ireland, Italy, the Netherlands, Norway, Portugal, Sweden, the United Kingdom and Yugoslavia).

Looking ahead, it is clear that in the 1990s there will be a need:

- To reassess environmental monitoring.

- To progress with the knowledge of natural resources stock. However, considerable progress still needs to be made in these matters. Work in Norway and France on natural resource accounting is most encouraging.[1] These accounts deal not only with flows (as in national economic accounts) but also with stocks. This would, for land and land cover, much benefit from remote sensing techniques.

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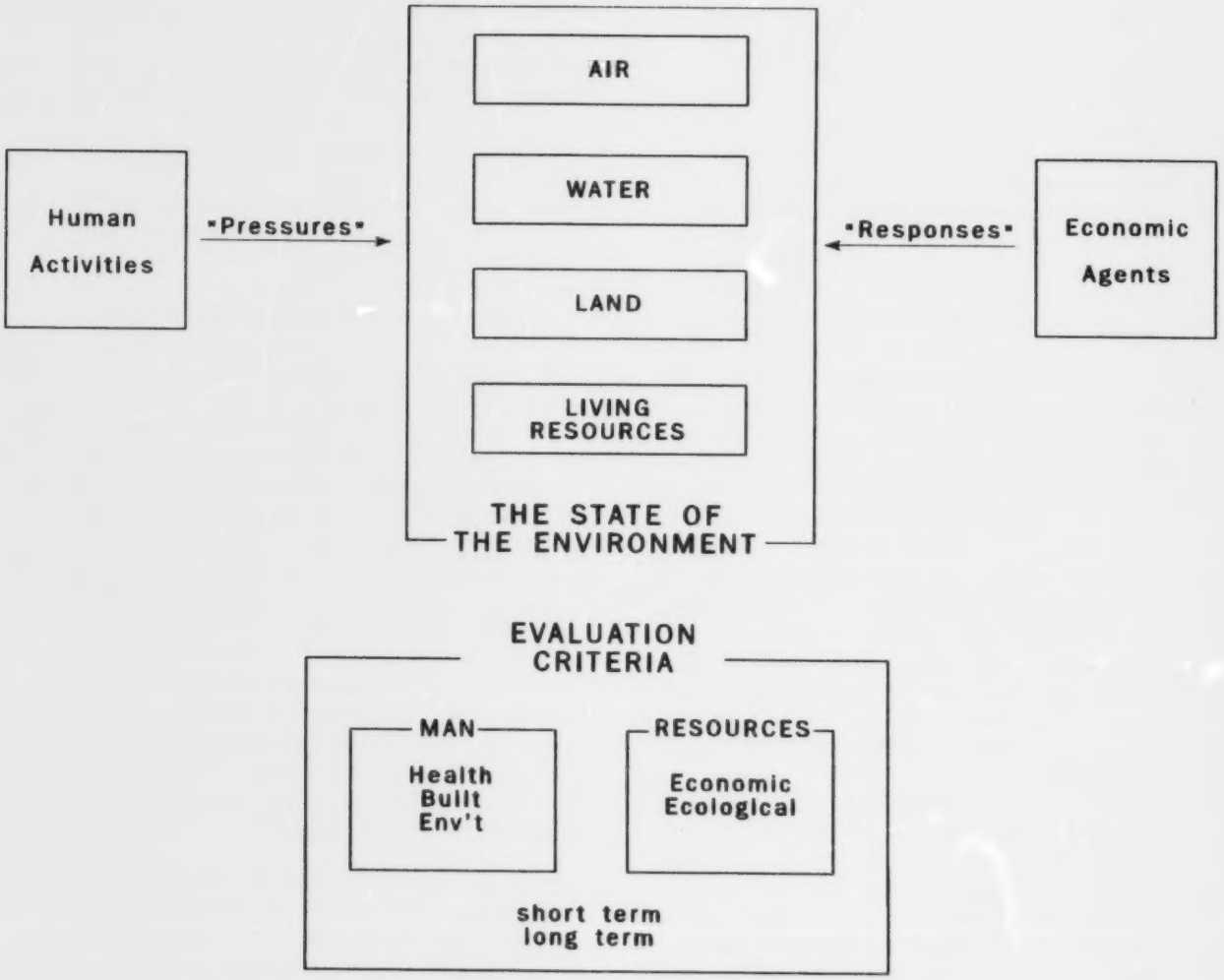
1) OECD (1986) Information and Natural Resources, OECD, Paris.
OECD (1988) Environmental Monitoring, OECD, Paris.

FIGURE 2. SCOPE AND FRAMEWORK OF THE OECD REPORTS



- To provide more economic data on environmental issues. The yearly publication in France of economic data on the environment is of key interest here.

- Most importantly, to proceed with work on environment indicators as more aggregate information on the environment is provided to various parts of government and administration structures of Member countries.

Which Production Process?

The process of producing national and international reports on the state of the environment involves extensive consultation. As such, the production process itself is of major importance in achieving the aims assigned to the report. Here the Japanese report is particularly instructive. Its production provides the opportunity for horizontal examination of questions usually dealt with sectorally, without much communication between administrations responsible for air, water, land and other natural resource management, or for nature conservancy. In addition, consultation takes place with other ministries and departments, such as those responsible for agriculture, industry, energy and transport, etc. This dialogue is very important because it provides for an awareness of the potential environmental impacts from each kind of activity, an awareness which in turn can help to more effectively prevent sectoral activities from having adverse impacts on the environment. In summary, environmental reporting contributes to both internal and external integration.

International reports on the state of the environment also provide the opportunity to consult regions, federal states, or provinces constituting a nation (or the Member countries of an international organization). The extent of this consultation depends upon:

i) the extent of centralisation of federalism of the country;
ii) how much the national report deals with specific regions.

Similarly, consultation can take place with the private sector: firms, unions, non-governmental organizations. These consultations are not only necessary, but have value in themselves.

The production costs for such reports include direct and indirect costs. Direct costs are incurred for the drafting team and immediately associated statistical work (30 to 60 man-months depending on the report), the costs of printing, translation (if any), and distribution. Indirect costs are incurred for the consultation process. The direct and indirect costs can be significant.

This leads to the question of what kind of team should be responsible for producing environmental reports. A high degree of quantitative and economic capability, and an excellent horizontal understanding of environmental problems and policies seem necessary. Should the team be made up of "independent" experts or of civil servants? The second case is the one most often found today. Should there be an autonomous team inside the Environment Ministry, as in France, Japan and Sweden, or an outside team, as in the United States (the CEQ)? There are no universal answers to these questions; however, the team must be guaranteed both access to information and independence in expressing opinions within the consultation process mentioned above. Given the uncertainty surrounding some issues, contrasting views might have to be presented: for instance, a scientific view and a policy-oriented view; what is known contrasted with what is not.

Presentation and Distribution

The presentation and distribution of the reports must be seen in the light of their target audiences: environmental agencies, government decision-making bodies and the general public (Figure 1). It is probably in such presentation and distribution that the most cost-effective progress can be achieved.

As mentioned above, the reports provide an opportunity for a horizontal review of environmental problems inside the environmental agencies themselves; they

may permit assessment and realignment of environmental policies, preventing unduly rigid compartmentalisation. It must be emphasized that any given country's report may be a valuable source of information and ideas for environmental agencies in other countries wishing to introduce or realign their environmental policies, or merely to have a composite summary for information. For example, what many members of European and American environmental agencies know about the Japanese environment is largely based on information from the Japanese national report.

The government decision-making bodies constitute a second type of audience. It is difficult, however, to assess the impact of national reports on such non-environmental departments. The state of the environment reports supplement conventional reports on the economic situation and outlook, and thus contribute to a balanced overall analysis of development problems. By highlighting the interfaces between environment and economic activities (agriculture, fisheries, forestry, industry, transport, energy...), these reports on the state of the environment help to ensure that environmental concerns are better taken into account in the decision-making process of non-environment departments. Indeed, these activities may involve exploitation or renewable resources, production of waste, physical restructuring of the environment, and/or the exploitation of non-renewable resources.

The general public constitutes the third type of audience. This covers scientific and education circles, environmentalists, businessmen, the media and the public at large. The impact of these reports on scientific and education circles, although of high priority, is not sufficiently understood. Environmental reporting contributes to better, more informed discussion with environmentalists and businessmen. Finally, these reports have a considerable impact on the media, which in turn reflects the concern among the general public. All these impacts need to be carefully monitored in order to tailor the report to the large audiences.

Consequently, should there be several reports, to serve varying aims or audiences? Experience of the various reports published to date, especially by Japan and the OECD, shows that they can at least include:

i) a main report in a comprehensible form and of reasonable size aimed at practically all audience categories, and in particular at administrations;

ii) the conclusions of the report, designed mainly for decision-makers (members of Parliament, senior officials and managers, members of governments);

iii) a digest with illustrations and summary data, designed more particularly for the press, the general public and anyone wanting a rapid introduction to the main report.

A greater understanding of the different types of audience for these reports is needed. In an attempt to elicit reader response, questionnaires could be administered (e.g. U.S., Japan) or a series of seminars could be held to tailor the report more closely to demand (e.g. Sweden). These reports should therefore be distributed to the various audiences as appropriate; for instance, to national, regional and local governments in the country concerned, to the educational system, universities, secondary and primary schools and to top decision-making circles. International distribution (and translation) should also be kept in mind.

In many cases, publication of the report is associated with some special event and given extensive press coverage. For example, the Japanese report is published on the occasion of the national "environment week", and the OECD report was published to coincide with a meeting of Environment Ministers. Annual sectoral reports on the state of the environment by UNEP (United Nations Environment Programme) are published on world environment day, and launched with a press conference. The publication of the report can be accompanied with maximum effect by media coverage, articles in specialized and scientific

magazines, and appropriate seminars. To date, however, far more effort has gone into producing the reports than into presenting and distributing them.

Conclusions

We now have enough experience with reports on the state of the environment to be clear about their aims, and to improve their content and data base, while more effectively organizing their production and improving their presentation and distribution. The OECD work programme has benefited extensively from this accumulated experience.

The changing circumstances of today give additional importance to reports on the state of the environment:

- concern with sustainable development at international and national levels calls for a reassessment of the interactions between economic activities and the environment;

- public discussion and expectations are most lively, and focus on new themes - major technological hazards, global problems and natural resources management under economic and demographic pressures.

Environmental information and reporting are thus all the more necessary today if we are to make environmental policies more efficient in an evolving economic and diplomatic context, within the framework of democratic debate.

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Discussion

Asked whether any agencies are providing information through media other than the printed report, Dr. Avérous indicated that a number of environmental information centres are asking what other kinds of products could be developed. The national report and compendium approach is easy, but it is heavy and costly. Alternatively, agencies could answer specific questions on scientific topics, as is happening in Germany, the Netherlands and France. In France, an electronic videotext system can provide on-line information on some topics, although lack of resources has prevented full development of the service. Ministry public relations offices can provide some help in disseminating information.

ANNEX

ORGANIZATION FOR ECONOMIC
CO-OPERATION AND DEVELOPMENT

GENERAL DISTRIBUTION
Paris, 23rd May, 1979
C(79)114

COUNCIL

RECOMMENDATION OF THE COUNCIL ON REPORTING ON THE STATE OF THE ENVIRONMENT

(Adopted by the Council at its 490th Meeting on 8th May, 1979)

(The Permanent Representative of the United Kingdom who accepted this Recommendation ad referendum has now confirmed his agreement.)

The Council,

Having regard to Article 5(b) of the Convention on the Organization for Economic Co-operation and Development of 14th December, 1960;

Having taken note of the Report on the State of the Environment in OECD Member countries;

Considering the need for better information for the public on the state of the environment;

Considering the importance of the relationships between pressures induced by human activities and the response of the environment in terms of the state of natural resources and the quality of human life;

Considering the need for a better knowledge of the state of the environment and its changes over time, for the purpose of a better assessment of the results of past actions and to contribute to the development and harmonization of environmental policies;

Considering the need for information designed to integrate more fully environmental considerations in decision-making;

Considering the work of the OECD in the field of development and use of statistics and indicators and particularly the Social Indicators Development Programme;

On the proposal of the Environment Committee;

I. RECOMMENDS that Member countries:

1. reinforce their co-operation within the OECD with a view to improving environmental information and environmental reporting;

2. intensify efforts to improve scientific knowledge, information, statistics and indicators on the state of the environment, in order to contribute to the evaluation:

   - of the state of the environment,
   - of activities that have an impact on the environment,
   - and of environmental policies themselves,

   with emphasis on important areas in which comparable and practicable indicators can at the present stage be defined;

3. prepare periodic national reports on the state of the environment and its changes over time.

II. INSTRUCTS the Environment Committee:

1. to promote and facilitate the exchange of experience and information among Member countries concerning the development and use of environmental statistics and indicators, and of reports on the state of the environment in order to support Member countries' activities in this field;

2. to continue:

   - the efforts to develop comparable environmental indicators and information formats which might be used in the preparation of reports of the state of the environment,

   - and to improve methods for the assessment, on a continuing basis, of environmental changes in important areas (through techniques such as basic monitoring of pollution, remote sensing, ecological mapping, special surveys and inventories), in order to arrive at a core set of comparable environmental information for OECD Member countries.

3. to ensure that a periodic report on the state of the environment of OECD Member countries is prepared and issued, to the extent practicable and appropriate, on the basis of national reports on the state of the environment and of a core set of comparable environmental information, and to report to the next Meeting of the Environment Committee at Ministerial level, if such a Meeting is decided by the Council at a later stage;

4. to carry out these tasks, taking into full account the work of other international organizations, concerning particularly environmental statistics and assessment of the state of the environment;

5. to report to the Council on the measures taken pursuant to this Recommendations.

THE FEDERAL APPROACH TO SOE REPORTING

Paul C. Rump

Abstract

The goals of the federal SOE reporting program are to involve all stakeholders, to use data and monitoring systems more effectively and to package products both to inform Canadians and to assist government and private-sector decision makers.

The major components of the federal structure are: dedicated organizational units; two lead agencies – Environment Canada and Statistics Canada – supported by other federal agencies whose mandates include environment and resource management; a network of contacts and coordinating committees in Environment Canada and other agencies to facilitate the process; an SOE Public Advisory Committee for public input; a computerized SOE information system; a science capability to provide a credible basis for SOE interpretation and analysis; and the capacity to produce a continuous range of SOE products to meet diverse audience needs.

A number of challenges for the 1990s can be identified. Enhanced partnerships with other governments, agencies and NGOs are needed. Information must be appropriate and timely and must disseminate through audio-visual channels as well as the print media. Scientifically-based indicators meaningful to Canadians are necessary. And SOE information must be applied in decision-making and evaluation and to measure progress toward sustainable development.

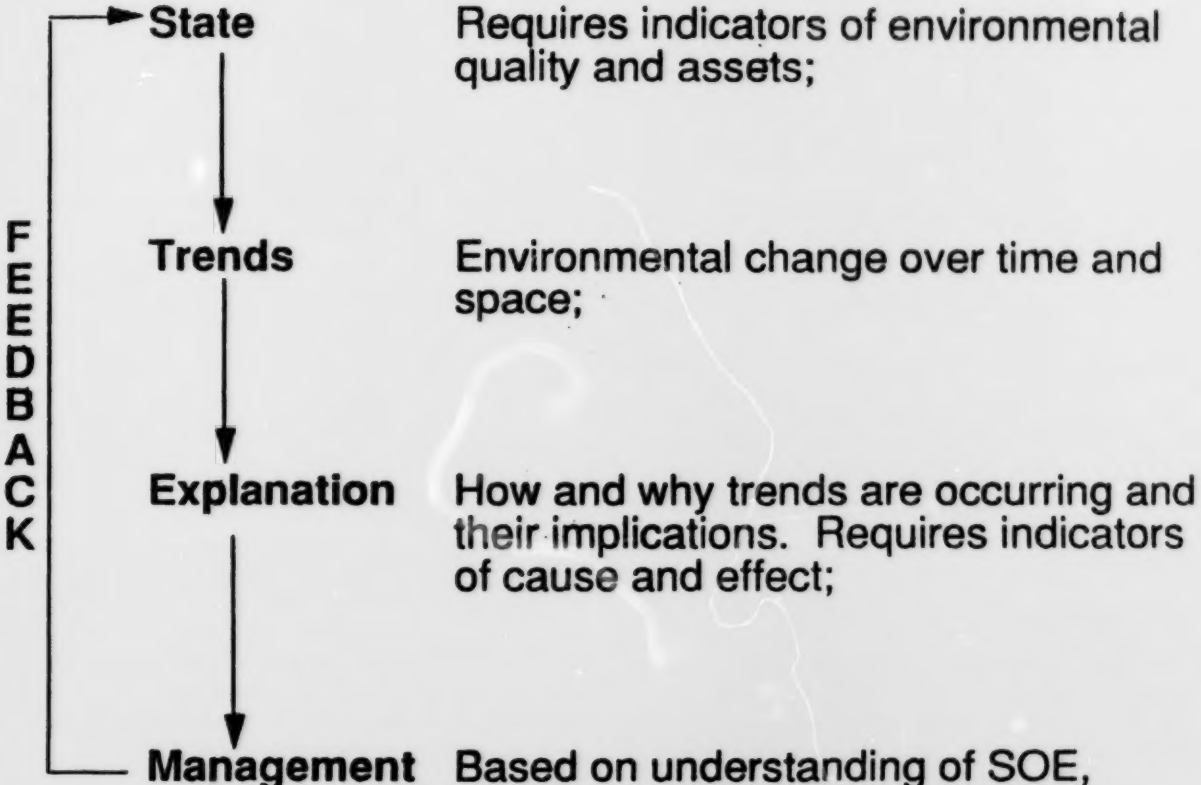
Introduction

The need to translate complex technical data into understandable information, and then the need to communicate that information effectively is vital in today's society. Similarly, there is a need to cross traditional subject-area boundaries to provide information from a comprehensive ecosystem perspective on environment-economy-health linkages. SOE reporting is seen as the vehicle for meeting these needs. In essence, SOE Reporting is being called upon to shift the emphasis from discussion of environmental issues to informed understanding and action by Canadians.

Figure 1 shows a model of the SOE Reporting process. The foundation of SOE is the scientific analysis of conditions and trends of environmental quality, environmental assets and human activity-environment interactions. Comprehensive SOE information should increase our understanding of changing environmental conditions. Such knowledge of cause and effect interrelationships is required to design an effective management response, which will have a positive impact on the state of the environment.

The federal SOE Reporting Program is based on these premises. The foundation for comprehensive reporting system is in place. It is not perfect, and it is open to improvement. The goals of SOE are to involve all stakeholders, to use data and monitoring systems more effectively, and to package products to both inform Canadians and assist government and private-sector decision-makers.

THE SOE REPORTING PROCESS


FEEDBACK
State
Requires indicators of environmental quality and assets;
Trends
Environmental change over time and space;
Explanation
How and why trends are occurring and their implications. Requires indicators of cause and effect;
Management Response
Based on understanding of SOE, measures Canadians can take to improve the situtation.

For the remainder of this presentation, I want to provide an outline of the federal SOE Program. In particular, I will discuss the origins of the program, the existing organization and focus, and finally outline some challenges for SOE reporting as we move into the 1990's. My aim is both to inform you and provide you with some discussion points for sessions later today and tomorrow.

The Origins of SOE Reporting in Canada

The emergence of SOE Reporting occurred in the late 1970's. Japan and the U.S., were the first countries to produce annual environmental quality reports. On the international front, the Organization for Economic Co-operation and Development (OECD) produced its first SOE report in 1979 and recommended that its member countries, which include Canada, complete national SOE assessments.

In Canada, early forerunners of SOE reports originated in the late 1970s with the **Human Activity and the Environment** Statistical Compendium of Statistics Canada and the **Environmental Quality** report of Environment Canada's Atlantic Region. Subsequently, in 1985/86, second versions of these reports were published together with the first national **SOE Report for Canada**. These early reports were realized largely through the efforts of individuals operating within existing programs whose focus was not SOE Reporting. A comprehensive process was lacking to support the systematic production of SOE reports and information.

The Current Federal SOE Reporting Program

SOE Reporting at the federal level entered its second phase of development from 1986 to the present. During these three years, a comprehensive structure was established to deliver SOE reporting on a continuous basis. SOE Reporting as a **government-wide** initiative was approved by Cabinet in 1986 and enshrined as legislation in 1988 as part of the new Canadian Environmental Protection Act. Under the Act, the Government is committed to providing "information to the people of Canada on the state of the Canadian environment". In addition, the Minister of the Environment may "publish on a periodic basis data on environmental quality, pertinent information to inform the public on all aspects of the quality of the environment,... (and) a report on the state of the Canadian environment".

The major components of the federal SOE reporting structure are:

- organizational units dedicated to SOE reporting;
- two lead agencies, Environment Canada and Statistics Canada, supported by other federal agencies whose mandates include environmental and resources management;
- a network of contacts and coordinating committees in Environment Canada and other agencies to facilitate the SOE reporting process;
- public input through the SOE Public Advisory Committee;
- the development of a computerized SOE information system;
- a science capability to provide a credible basis for SOE interpretation and analysis; and
- the capacity to produce a continuous range of SOE products to meet diverse audience needs.

I would like to discuss a few of these components in more detail.

SOE Organizational Units. Early attempts at completing SOE reporting in Canada are characterized by the efforts of a few people. This was certainly the case with the 1986 national SOE report where two authors, although supported by the results of numerous contracts, were responsible for its completion. To expand this approach to more fully meet public expectations for SOE information, organizational units dedicated to SOE reporting were established in the two lead agencies, Environment Canada and Statistics Canada. In addition, essential support to SOE is provided by a network of committees and points of contact to provide coordination, communication and products within the headquarters and regional units of the lead agencies and other federal agencies such

as Agriculture Canada and Health and Welfare Canada.

In Environment Canada, an SOE Reporting Branch has been created in the Corporate Policy Group. This positioning recognizes SOE reporting as a horizontal program associated with sustainable development initiatives, which requires active participation across the Department and within other federal agencies. The SOE Branch is composed of three Divisions:

a) the Environmental Analyses and Reporting Division responsible for managing the delivery of the various SOE reports and products including the five-year national assessment;

b) the Environmental Information Systems Division which provides the GIS services for SOE reporting including the interface between Environment Canada and Statistics Canada; and

c) the Strategies and Scientific Methods Division responsible for long-term planning and the development of SOE reporting methods and techniques.

In Statistics Canada, an Environment and Natural Resources Section supports SOE Reporting and public access to environmental data. The development of an operational Information System is central to meeting these objectives.

The Public Advisory Committee. Public involvement has always been an integral feature of the federal SOE program. Prior to the establishment of the present organizational structure in 1987, a stakeholder group with representatives from industry, labour, environmental and consumer organizations, and provincial and federal governments prepared a position paper on SOE reporting. This direct involvement continues via the SOE Public Advisory Committee which was established in late 1987. The Committee, which meets about four times a year, is composed of 10 members from non-government organizations, consumer groups, industry, and academia. The terms of reference direct the Committee to provide long-term strategic planning advice to Environment Canada and Statistics Canada. To date, the Committee has provided advice on such matters as the 1991 national report and SOE indicator development, and has strongly encouraged the development of an SOE conceptual framework.

The SOE Information System. The development of integrated environmental databases at the national or broad regional level suitable for SOE reporting is relatively weak in Canada. The establishment of an SOE Information System in Statistics Canada will correct this weakness and provide the link to the better organized national socio-economic data which is critical for the explanation of SOE conditions and trends. The concept of the SOE Information System recognizes the existence of sectoral and integrated data banks. The system will not duplicate existing data by forming a massive central repository. Rather, it will emphasize a network approach establishing links to databases of relevance to SOE. The three elements of the SOE Information System are:

a) a central GIS database consisting of selected key indicators most representative of the state of the environment;
b) a tabular information system for non-spatial data; and
c) a referral component to provide improved access to the more specialized socio-economic and environmental data bases.

Much of the socio-economic data required for SOE reporting is already included in the SOE Information System. We are currently assessing environmental and related databases of Environment Canada and other federal agencies from an SOE perspective. Statistics Canada is to have the SOE referral system in operation by the end of 1990 and the SOE Information System operational by 1991.

Once the federal information has been captured, the questions of **provincial and territorial input and access** need to be addressed. This workshop and the small

group sessions represent an ideal opportunity to start this process.

Science and SOE Reporting. The scientific approach is an essential element of the federal SOE program. This emphasis is necessary to achieve improved credibility and understanding of cause and effect relationships and environment-economy-health interrelationships. This, in turn, is instrumental in moving the public debate from a discussion of problems to a search for solutions.

There are three research areas which I would like to briefly discuss:

a) the development of spatial frameworks;

b) the demonstration of integrated analysis and interpretation methods; and

c) the development of indicators.

a) Spatial Frameworks: One of the inherent characteristics of SOE is the comprehensive reporting of environmental conditions on a consistent basis over time and space. With trends in time it is usual to report environmental phenomena on a five or ten year cycle, especially for broad regional, national and international SOE reports. The selected dates usually relate to major data generating activities such as the population or agricultural census in Canada. However, the selection of geographical units for reporting is more difficult. A basic dilemma exists: should SOE reporting be accomplished by using familiar administrative or jurisdictional units, or by using more environmentally or ecologically-determined boundaries. Most existing data useful for SOE reporting are collected using administrative boundaries. However, ecological units provide better frameworks for analysis and interpretation of cause and effect relationships.

To resolve this dilemma, we have developed a combined approach which allows the presentation of data by both administrative and ecological units. On a national scale, this would use provincial/territorial boundaries and about 45 ecological units called ecoprovinces.

This proposal builds on the approach used in the 1986 SOE report, but provides a better resolution of ecological units (about 45 compared to 15) and a better linkage between administrative and ecological units. Such a composite spatial framework is being considered for use in the 1991 Statistics Canada report on human activities and the environment.

b) Integrated Analysis and Interpretation: The objectives of SOE reporting are not achieved through the presentation or description of environmental data and information. Integrated analysis and interpretation are key attributes to promote understanding and improved decision-making. As the SOE model shows, we need to fully understand cause and effect relationships before we can prescribe appropriate management solutions. One way to help increase our understanding of cause and effect relationships is to distinguish between indicators of environmental stress and indicators of environmental response.

We have been working with the St. Lawrence Action Centre to demonstrate an integrated SOE approach based on existing data. The interrelationships we have been studying for the St. Lawrence River Basin include:

- urban stressors (e.g. municipal waste water, industrial effluents, waste sites, dredging, etc.) and possible environmental response such as the quality of water, sediments, and fish;
- agricultural stressors (e.g. the use of fertilizer, pesticides, manure, and equipment cleaning detergents) and water quality;

- urban and/or agricultural stressors and possible resources at risk (e.g. fish spawning grounds, wetlands, heron nest sites, etc.)

By using an integrated approach to focus research on stress-response interrelationships, SOE can assist environmental decision-making in a number of ways. A good understanding can help managers: a) identify where the concentration of stresses are the highest and which environments are most at risk; b) target and priorize waste sites for remedial action; and c) show what adjustments are required to data acquisition networks to improve future assessment precision.

c) Indicators for SOE Reporting: The development of indicators for SOE reporting represents the most critical and strategic area of SOE scientific research today. Indicators serve to transform and summarize technical data often collected for a specific purpose into understandable and meaningful information which can be communicated effectively. Indicators are key to translating the results of science into environmental policy and priorities for action.

Our current interest in indicator development commenced about one year ago. Since then, we have conducted or supported a number of projects to develop our knowledge on indicator research and development. We have assessed the North American indicator literature and are currently assessing available data.

We have also established a set of guidelines to assist data holders, scientists, and authors to select appropriate indicators which are compatible with SOE objectives. We are establishing a national network of indicator researchers and users, and assessing areas of strengths and weaknesses in indicator research relevant to SOE reporting. From this, we will be developing a comprehensive action plan for future indicator research.

Some priority areas of the indicator action plan are already under development resulting from the current high profile of SOE reporting at national and international levels. The Prime Minister, for example, recently called for compatible SOE indicators at the international level to measure progress towards sustainable development. His proposal was endorsed by the Paris Economic Summit which directed OECD to conduct work in this area.

This international initiative will be greatly assisted by the research in Canada to assess the feasibility of developing a national set of SOE indicators. Such a comprehensive, but concise set of indicators (or composite indices) is analogous to the familiar economic indicators (for example the Consumer Price Index and interest rates) continuously reported in the media. Such a tool represents a distinct SOE reporting product designed to convey broad SOE trends to decision-makers and Canadians.

To complement indicator research at international and national levels, there is also a need to develop SOE indicators for specific SOE reports which are more geographically focused or more selective. We are using the marine environment, where we are relatively data poor, as a prototype. In cooperation with data managers, we want to reach consensus on what marine parameters are most appropriate for SOE reporting purposes.

Finally, we have investigated in a preliminary way the application of indicators to measure progress towards or away from sustainable development. A framework, approach and criteria have been developed for indicators which measure trends in socio-economic activities that affect society's progress towards the state of environmentally- sustainable development. As a follow-up project, the framework and indicators were tested using the forestry sector as a pilot. Indicators were selected for harvesting and renewal, efficiency of resource use, and

environmental effects.

Although the results are encouraging, it was not possible to definitively say, using available information, whether or not forest resources are being used sustainably. For example, increasing harvest levels and amounts of not-satisfactorily restocked land represent warning signals, while increases in reforestation, silvicultural activity, and efficiency in forest products processing are positive signs.

SOE Products. Over the last two years, considerable effort has been directed at developing a federal program which could quickly deliver SOE products to the Canadian public. To meet this objective, it has been necessary to select products from initiatives already underway. Using this practical approach, we have developed a 5-year plan for SOE reporting products.

Currently, we are building on this approach by systematically assessing environmental issues from an SOE viewpoint. It is being accomplished by analyzing mass-media reporting of environmental issues. The issues are organized by a modified stress-response framework into three categories:

- agents of change;
- environmental responses; and
- indirect socio-economic responses

Each issue has been rated according to criteria relevant to SOE reporting including geographic scope, longevity, severity of impact, availability of information, degree of public concern, etc.

From this assessment of environmental issues we are now in a better position to forecast:

- the emerging environmental issues for the 1990s;
- the issues adequately covered by existing or planned SOE reports;
- the issues which represent an opportunity to inform Canadians on the state of their environment.

Such an approach assists in keeping the SOE program comprehensive with pro-active reporting on topics relevant to Canadians.

To many people SOE reporting represents the periodic publication of one document assessing environmental conditions and trends for the total country or jurisdiction under consideration. At the federal level we employ a more flexible, more ambitious approach aimed at issuing a variety of products on a continuous basis. Nevertheless, the five-year national assessment, with the next issue scheduled for 1991, does represent a flagship for the program. This report will be presented to Parliament by the Minister of Environment. It will represent an **extensive collaborative achievement** especially at the federal level but also involving other stakeholders. Federal agencies contributing chapters include Agriculture Canada, Forestry Canada, Indian and Northern Affairs, Fisheries and Oceans, and Health and Welfare. We have encouraged chapter authors to include provincial and territorial colleagues in preparing, reviewing and vetting manuscripts. Looking ahead to 1996, we would like to build on the experience of the 1991 report and with a longer lead time achieve **complete participation of provinces and territories** commencing at the planning stage. This aspect, again should stimulate some good discussion in subsequent workshop sessions.

Existing SOE reports use various organizational approaches determined by issues, renewable resource sectors, environmental media, or environmental processes. In the 1991 national report, a combination of these approaches is employed with special emphasis on interpretation within a sustainable development context. A major part of the report covers conditions and trends for various environmental media and resource sectors. This is followed by sections on regional case studies, and current and emerging issues. The penultimate section will discuss some of the management responses to environmental problems and the resulting impacts on the state of the environment.

Other major SOE reports will also be issued

in 1991. Statistics Canada will be publishing a third volume on human activities and the environment, while Health and Welfare Canada will be publishing a report on human health-environment interrelationships.

In addition to these national efforts, the federal government is also providing comprehensive and analytical SOE information on a continuous basis through more selective reports and fact sheets. These documents provide a more in-depth and timely interpretation than possible in a national overview. Such reporting can focus on specific regions, issues, media, or renewable resource sectors, or on a particular environment-economy-health relationship, for example, the use of pesticides on the Prairies.

Recently released and planned fact sheets and reports are shown on the overhead. The subjects selected range from marine pollution, to endangered species, parks, air quality, atmospheric change, groundwater and urbanization of rural land.

We publish an SOE newsletter featuring articles both from internal and external authors. Three issues are published every year. We try to keep up with SOE news from the provinces and territories, but we need your cooperation to enable us to fully reflect your views and your progress.

There is a final group of products that help market the overall federal SOE program to Canadians. Currently, this consists of a brochure, the display you have already seen, and a poster. These products are aimed at making the public aware of the SOE program and preparing them to receive the more substantial SOE products.

Challenges for the 1990s

At the federal level we have a system in place to deliver a credible SOE Reporting program as demanded by policy and legislation. SOE products are being distributed and others are planned, an information system and scientific research support the program, and a public advisory committee provides strategic guidance.

Where do we go from here? How can we improve our efforts? What are the major challenges?

Enhanced Partnerships. This workshop is our first effort to involve collectively the provinces and territories in SOE reporting although several bilateral discussions have occurred. We hope that the workshop discussions will lead to follow-up that results in a true national program with full partnership in, for example, the production of the 1996 national SOE report. The opportunity also exists to work through CCME and the various Round Tables on SOE indicator initiatives and information system development.

We must strengthen our links to NGOs both environmental groups, and representatives of industry, and broad based socio-economic groups. SOE reporting must be demand-driven and at present our client links need strengthening.

Timely, Appropriate Information. SOE reporting is only as good as its information base. In many ways we are data rich as there is an abundance of sectoral, local, and regional data. However, the information base to facilitate national SOE reporting showing trends and interrelationships between health, economic and environmental factors is weak. It also takes us too long to disseminate data and information. This is not helped by national SOE reports being issued during census years whereby it is impossible to take advantage of the more recent census data.

The target opening date of the SOE information system in Statistics Canada represents a major challenge. We will need your full cooperation to develop a credible, comprehensive information system to meet Canadians' needs.

To be timely and appropriate with SOE information we need to strive continuously to broaden the range of products to meet the diverse needs of Canadians. We are presently limited to the print media. The majority of Canadians receive most of their information through the mass-media

particularly television. In the 1990s, we will need to include audio-visual products in our communications' arsenal.

Indicators. A good start has been made towards the development of indicators. As we have seen, political expectations are high. However, the challenge is such that we must be realistic. A 20-year period was necessary to put our system of economic indicators in place.

Previous well-resourced attempts at developing a comprehensive system of environmental indicators have largely failed in Canada and the USA. Yet, the need to develop and apply indicators successfully is compelling, and we need to build on successes such as the existing Air Quality Indices. A cooperative approach with data managers and indicator researchers is essential. The challenge is to produce scientifically-based indicators which are meaningful to Canadians. Since judgments will always be necessary in the development and selection of indicators, an appropriate institutional mechanism to derive and disseminate indicator results and related interpreted information is critical. The establishment of an independent agency at arms length from government represents an attractive alternative for this task.

SOE Information for Decision-Making. At the federal level, our initial priority has been directed towards establishing a program to inform Canadians. A second major objective of SOE, which will be more important in the 1990s, is the active application of SOE information in decision-making. The value-added of SOE will be clear when its interpretation and assessment of the conditions and trends in the environment is used to evaluate the environmental performance of governments, industry and the country as a whole. This can be achieved at a number of levels. The linkage between SOE and sustainable development is very close. SOE reporting is the major tool required to measure progress towards, or away from, the goal of sustainable development. SOE reporting can also be used to evaluate programs such as forest management, soil conservation, or regional environmental enhancement efforts such as the St. Lawrence project. By highlighting success stories and problem areas, SOE can help establish research priorities, or select areas where restoration or prevention measures are required. The identification of data inadequacies which impede SOE interpretation and assessment can help influence the future development of environmental monitoring systems.

To be successful in these areas, SOE reporting will need to be more sensitive to the information needs of managers. What type of information is required? At what level of aggregation and accuracy? To meet this challenge, SOE may be required to custom-design more of its outputs to suit client needs. This will be possible, at least in a data sense, with the full establishment of the SOE Information System.

Partnerships, timely information, indicators, diversified products, decision-making needs -- these are my selected challenges for SOE in the 1990s. I hope my remarks will help stimulate the discussions in the subsequent workshops. On behalf of my federal colleagues, I look forward to active participation with you on cooperative SOE ventures in the future. Thank you.

Paul Rump is Associate Director, SOE Reporting Branch, Environment Canada

Discussion

Mr. Rump told questioners that indicators for sustainable development are under development. There were mixed results from a pilot study related to forestry, the report of which is available. There are no definitive indicators as yet that say whether we are moving toward sustainable development.

Answering a question about the national network of researchers and users, Mr. Rump explained that federal researchers involved in indicator development are currently being surveyed by questionnaire. A lot of interest has been shown in the network.

QUEBEC'S EXPERIENCE
"Presentation by the Québec Ministry of Environment"
Paul Meunier

Abstract

Québec published the first provincial SOE report in 1988. Those charged with the responsibility listed issues to be tackled and main indicators to be used. Government departments or groups were asked to write some parts of the report; other parts were written by the survey team. About six months was allowed for this, but few groups met the target. Frequently the abundant data had not been processed, and preparing maps took longer than expected. Texts were longer than had been anticipated, and writing styles by the various authors were not uniform. Accordingly, the deadline was extended by a year, to spring 1988, and a firm was commissioned to rewrite the document. Nearly 2000 copies of the 450-page technical version and 10 000 copies of the summary have been distributed.

The most important lesson is that there must be consolidation of the environmental data retrieval system. The various partners must share the work and the lead agency must allocate sufficient permanent human and financial resources to produce regular reports. Future reports will be published every three years, as the environment does not change quickly enough to warrant annual reports. Five years seems a little long and there could be a loss of interest by partners and public. The two-version format for SOE reporting seems best.

As you probably all know, in spring 1988 Québec published its first report on the state of the environment. It was the first province in Canada to do so, and accomplished the task relatively quickly and with modest means. We thought it might be interesting to outline the main stages of the project to show that a report of this type does not require large human and financial resources. Moreover, we feel that meetings such as this, which are aimed at sharing knowledge and expertise, can only make the publication of state of the environment reports easier for the departments and agencies concerned.

Presentation Highlights

- publication of the first report
- some reasons for its success
- the knowledge gained
- future reports
- future trends in state of the environment reports

Publication of the First Report

The Mandate and Initial Questions. Around November 1985, the Ministère de l'Environnement's Environmental Planning and Assessment Branch undertook a strategy planning operation. The first step was to ask ourselves: "What do we know about our environment?" and "What are the current problems re environment quality?" We realized early on that we did not have the answers to these questions, which led to our decision to produce a report on the state of the environment. In early 1986, the Direction des stratégies et politiques environnementales was given its first mandate to define the situation and briefly outline the potential contents of the first survey of Québec's environment based on easily accessible data from the various government departments.

Marketing the Project. In early fall 1986, the Department mandated two people to produce the first-ever report on the state of the environment.

The main objectives of the report were:

- to diagnose the state of the various natural environments;

- to identify the principal human activities responsible for the deterioration of these environments; and

- to provide an easy-to-understand document on environmental issues.

June 1987 was set as the distribution date for the report.

The Procedure Followed. After briefly consulting a number of similar reports, we drew up a list of the issues to be tackled and a list of the main indicators for evaluating the state of the various environments. Based on these two lists, we established the contents of the future report.

During this period, we determined which group or government department would be responsible for writing each chapter or chapter section. Meetings were organized with the various administrators within Québec's environment department to present the work plan to them and reach a consensus on it. Gérard Divay, assistant deputy minister of planning and assessment, contacted his colleagues from the other government departments to obtain their collaboration. Those chapters or chapter sections which were not assigned to a particular group or department were written by the survey team, which was composed of four people in early 1987.

The deadline for handing in texts was March 10; however, despite their efforts, few groups succeeded in meeting it. Every day we realized that despite abundant data on the subject, often it has not been processed, which slowed down the writing of the reports. As well, we seemed to have underestimated the effort and time required to enter information on the maps. When the first texts were submitted, we were faced with a lack of stylistic standardization throughout the chapters. Moreover, most of the texts were much longer than expected, resulting in a preliminary version of approximately 1600 pages. In order to deal with these unexpected problems, we had to push the deadline back to spring 1988.

Rewriting and Revision. To standardize the style and presentation of the different chapters, a firm was commissioned to rewrite the document so as the produce a technical version and a summary version. After an initial analysis of this preliminary document, the firm suggested how it could be restructured to cut out 600 or so pages.

The recommended changes were discussed with the various collaborators and a new text was submitted in late summer 1987. The firm then proceeded with the actual rewriting and popularization process. The new text was submitted to the collaborators for revision and approval. In late December 1987, the technical version of the environmental overview numbered some 900 pages. It was at this time that we began final production on the maps and illustrations to be included in the report.

During the revision of the technical version, the highlights of each chapter were jotted down to serve as a basis for writing the summary version. I would like to take this opportunity to mention the valuable contribution of Gérard Divay, assistant deputy minister of planning and assessment, to the final revision of both works. The preliminary version of the summary report was completed in late February.

During this time, a private firm did the mock-up of the technical report using desktop publishing. Numerous revisions and corrections were carried out during February and March, and in early April, both versions were finally ready for publication.

The Final Products. Two reports were finally launched: a 425-page technical document containing 15 chapters and 5 special sections, published in 1000 copies; and a colour summary version, which followed the presentation of the technical document fairly closely and was published in 10 000 copies. Both versions were distributed free of charge on request. The first edition of the technical document was sold out in just five months and the second edition is nearly sold out, as are the 10 000 copies of the summary report.

Some Reasons for its Success

One reason for the report's success was the tremendous involvement of the assistant deputy minister of planning throughout the duration of the project. His discerning comments and encouragement were a major asset from beginning to end.

Second, I must mention the excellent collaboration of the other departments and Ministère de l'Environnement staff.

And third, this report would not have been successful without the sustained efforts of the multidisciplinary group assigned to the job.

The Knowledge Gained

The experience of publishing a report on the state of the environment yielded a number of lessons, the first of which was that access to information can often be a problem. Relevant information was widely dispersed and our limited knowledge of the various data banks made optimal use of the information difficult and progress slow.

We also noted that for a project of this scale, we had to keep close track of the work being done by the different firms collaborating on the production of the report. Below is a short list of important points to be considered for future reports:

- create a permanent MENVIQ team to coordinate and write part of the report;
- establish a general reference framework for the overview;
- promote the creation of working groups within the various departments to complete the overview;
- work with the various partners to determine the situation of each natural milieu, resource and activity;
- identify the most relevant environmental descriptors and indicators;
- establish a data base on the environment using the strategic information needed to draft the overviews;
- continue looking for environmental indicators and favor their integration into the major sectors of environmental measures (air, water, etc.).

The general lesson learned is that it is impossible to produce satisfactory state of the environment reports without major consolidation of the environmental data retrieval system. Similarly, job sharing among the various partners is essential to ensure regular production of such reports. Finally, the government department or agency coordinating the project must allocate sufficient permanent human and financial resources if it wants to publish these reports on a regular basis.

Future Reports

Some time after the first report was published, we did a retrospective of the project. We realized that despite the short deadline and all the problems inherent in this type of project, we acquired greater knowledge and a better understanding of the state of our environment. Furthermore, the public's response convinced us to continue publishing state of the environment reports.

Retrospective Study of the First Environmental Overview and Establishment of a Reference Framework. Following a retrospective study of the different stages leading to the publication of the first report, we outlined a general reference framework to guide us in the publication of future reports.

This organizational framework outlines the following objectives for state of the environment reports:

- to promote the ecological management of our environment;
- to help assess the environmental impact of government and private sector programs and activities;
- to describe the state of the environment and identify trends;
- to provide decision-makers with access to recent, integrated environmental data as a managerial support tool.

The backdrop of future environmental overviews will be the sustainable use of resources for optimal management of our everyday environment.

With regard to structure, we chose to use the same themes and similar presentation as the first report.

Future reports will be published every three years, since the state of the environment does not change fast enough to warrant an annual report. A five-year basis seemed a little long and we felt there may be a loss of interest by our partners and the public.

Finally, we suggest keeping the same format as for the first report, that is:

- a technical version of approximately 450 pages, directed at scientists, managers, administrators and decision-makers;
- a summary version directed at a wider audience.

The reference framework also addresses the problem of role sharing among the various parties concerns.

Parties Concerned	Role
Ministère de l'Environnement	Coordination
Departments and other partners	Writing
Ministère de l'Environnement	Editing/ Publishing

The mandates and responsibilities of each party are defined in detail in a preliminary document.

Public Consultation. As announced at the launching of the first report, in March 1989 we held a series of public consultations to get the public's reaction to and suggestions for the publication of future reports. Two hundred and fifty invitations were sent out and over 100 people attended the meetings. We were able to discuss the general reference framework, as it was included in the consultation document.

The following were among the various issues dealt with:

- distribution of the overview;
- nature and objectives of the overview;
- environmental indicators;
- publication intervals;
- target audience;
- regional overviews;
- contribution of environmental groups.

The meetings were very productive and the suggestions made will help improve future reports.

One of the more interesting topics of discussion was the interest shown by a number of people in a more ecological framework for data presentation. This perspective would also allow for more adequate use of the environmental indicators of particular interest to the public and for which it has great expectations. Several people requested a more integrated approach to data processing; others would like to see an increase in regional data without neglecting the global picture. Finally, environmental groups would like to play a greater role in the preparation and distribution of the overview: in what form remains to be determined.

Meetings with Collaborators. During the public consultations, we met with the different government departments involved to discuss their collaboration on the next state of the environment report. Their comments, added to those of the general public, will allow us to work out the final details of the reference framework. During the meetings, we asked each department or agency to specify the environmental situation for their sector and submit the outline of their presentation for the next state of the environment report.

We hope to complete the table of contents for the 1992 report by the end of the year.

Future Trends in State of the Environment Reports. The second survey of Québec's environment will be a consolidation. First, we will establish a reference framework and encourage the creation of working groups within each department. Next, we intend to place priority on environmental indicators and encourage their use in future reports.

As well, we will attempt to establish a more ecological framework for data presentation. A pilot project may be launched by the Ministère de l'Environnement and the Direction du patrimoine écologique.

Given that quality information is the basis of a good report, we hope to work with the Bureau de la statistique du Québec to establish environmental statistics. A draft agreement between the Department and the Bureau has already been prepared and a formal agreement could be signed by the end of the year. At the moment we are exploring the concept of natural resource accounting and natural resource stock accounting, which would round out the list of tools for evaluating the environmental situation.

The Ministère de l'Environnement du Québec is encouraging publication of thematic and sector-based surveys in addition to the general state of the environment reports. The first survey of drinking water should be published within a few weeks, along with a series of studies on the change in air quality over the past decade.

Conclusion

The rapid distribution of Québec's environmental survey and the numerous comments elicited lead us to believe that the first report was a success.

A second overview should help us make even better use of the environmental data available and embrace the principle of transparency formulated in the Department's policy paper entitled "CAP - A New Environmental Strategy".

This next overview will be another tool to be used by the Department and other public and private-sector agencies for assessing long-term environmental impact.

We are fortunate to be able to share our knowledge on environmental matters with other government departments and agencies involved in this sector.

In the longer term, the development of environment quality indicators specific to each environmental milieu and natural resource, the need for more complete, meaningful environment-related statistics, and consideration of the relationship between economic, human and environmental activities will lead us to a new ecological accounting system. This approach to the situation will help promote social and economic change toward more sustainable use of the environment and natural resources.

Paul Meunier is with the Quebec Ministry of the Environment

Discussion

A question arose as to whether the dollar cost of environmental clean-up could be included in Québec's SOE report. Mr. Meunier replied that Québec has developed statistics on environmental

damage, including economic factors, which will be published separately and regularly. In the 1991 SOE report, case studies will be site-specific clean-up -- for instance focusing on an oil spill. The economic value of a resource base is related to the number of jobs dependent on it, he added, and that needs to be related to damage costs. Statistics Canada is collecting data on pollution abatement and control.

Statistics Canada noted that there is a larger question here of tying the dollar value of resources and the damage to the environment to economic accounts. Research at the federal level aims to put SOE and natural resources into an accounting framework such as in national wealth measurements (National System of Accounts).

SOE REPORTING IN THE ATLANTIC REGION

Peter Eaton

Abstract

The Atlantic Region of Environment Canada produced an environmental quality report in 1979 and later used the experience gained to produce a broader effort, the 1985 regional SOE report. This dealt with air and water quality, toxic chemicals, environmental management, health and conservation, but didn't analyse linkages in the ecosystem with report data or deal with "stress-response".

A concerted effort was made to evaluate the response to the 1985 report. Especially useful was a "round table" with people from universities, schools and NGOs. The advice received was to keep reporting, broaden the consultation, emphasize ecosystems more, look at relationships, do more analysis, use more examples, relate the report to people's experience, produce a better summary, improve the graphics and use other formats such as audio-video. Distribution of the report should remain free.

The media, universities and schools and NGOs used the report extensively, but other government departments used it less than expected. The public did not use the report much.

Lessons from the evaluation and experience related from the national SOE report team are incorporated in the 1990 report which will be more comprehensive, and better balanced. The workload is shared more broadly. The main theme of the 1990 report is environment, economy and health and underlying these, sustainability.

I am going to take you through some of the history and the background of what has been happening in the Atlantic Region with regard to State of the Environment (SOE) Reporting, or "environmental quality reporting" as we initially named it. Hopefully, from this history and the way we have been doing things, you will gain some insight as to the kinds of problems, the issues, the cooperation, and the various other aspects of what has been happening in the Atlantic Region.

Background

Taking you back some 11 years, the Atlantic Region took direction from an environmental quality policy that the federal government developed which stressed the idea that environmental quality has to be described across sectors. Environmental quality also has to be expressed to the public. It was felt that the Atlantic Region could do something along these lines. Obviously, there is a good reason to have the public better informed. It allows them to make better decisions on environmental matters. It allows them to take positive and correct action when they are faced with making decisions concerning their own environment. They are better prepared for monitoring changes in their own environment and for reporting on those changes to the appropriate authorities. And they are more likely to lobby or intervene on issues which

concern them in a more effective and accurate manner. Also, a well informed and sensitive public constitutes an environmental constituency which is most important. We, as environmental agencies, require their support. We require their acceptance of the kinds of programs we are involved with, and we want them to understand and support our involvement.

I'll just go over, again, the idea of public access to environmental information. There are lots of technical reports in the federal Department of the Environment; all kinds of scientific reports that are detailed and full of information. There are lots of raw data, as well as data that have been "crunched" and digested. There are lots of political speeches which describe the environment and what is being done. But, very often this information goes right over the head of the general public. It is often not integrated in any fashion and tends to deal with very small parts or compartments of the environmental story, instead of talking about the quality of the environment as a broad concern. Nobody is asking, "what does it all mean, what does this environmental information mean"? We have too few David Suzuki's in the world, I'm afraid, certainly in the Atlantic Region.

In the Atlantic Region, Environment Canada staff thought about how to tackle this problem of public information, and in 1976 came up with the idea of setting up, within the Environmental Protection Service, a unit called the Environmental Quality Division. The mandate of that Division was to integrate broad data sources and issues, to conduct comprehensive analyses of integrated data and information, and interpret those analyses in reports for broad public use. In many cases, this particular group was out on a limb. This was a new concept within a Department which at that time dealt with various narrow operational issues. Suddenly, there was a group that was looking at all kinds of broad issues: looking for emerging environmental problems. We were doing studies which involved interviewing fisheries officers to find out what kinds of environmental problems they came up against in their day-to-day activities. We started a study on the risk of cancer in the Atlantic Region to try to see whether there was any environmental connection. We even strayed as far as looking at the risk and environmental consequences of earthquakes in the Atlantic Region. Some of these studies were looked at with skepticism and a few of them were actually shelved, but, we were adventurous and continued to try to provide a new point of view.

The 1979 Environmental Quality Report

In 1979, the first environmental quality report for the Atlantic Provinces was produced by the Environmental Quality Division. The report was limited in its dealing with issues outside of the Environmental Protection Service mandate and therefore it was not as comprehensive as we would have liked. Nevertheless, it dealt with the quality of the environment in the region and was aimed at the public, and therefore was felt to be an effort in the right direction.

Along with this Regional overview there needed to be some other kinds of reporting--reports aimed at more specific areas of the environment. We therefore undertook to fulfill this need. The "Health of the Northwest Atlantic" was one of the reports that came from the Atlantic Region. It was done in conjunction with Fisheries and Oceans and Environment Canada, and it looked at the quality of the marine environment. It brought together a lot of integrated information on contamination and fisheries problems. The Environmental Quality Division undertook other such reports like the environmental quality of the Bay of Chaleur; environmental quality of Saint John Harbour, which is a polluted harbour in the Atlantic Region; environmental quality of Sydney in the industrial part of Cape Breton, the area where the Sydney Tar Ponds are now being cleaned up. Also, we did an inventory of environmental quality data in the Atlantic Region, which will make this kind of data available for our use in state of the environment reporting and for others both regionally and nationally.

The idea at the time was to produce a state of the environment report or an environmental quality overview for the Region every five years. The feeling was that on a five-year basis one can track trends, and trend reporting was one of our major objectives.

Elements of the 1985 Environmental Quality Report

The report, "Environmental Quality in the Atlantic Region, 1985", was a larger effort. This time we dealt with issues and problems on a much broader basis, and tried to aim it more at the general public. About 3,000 copies of the report were distributed throughout the region to municipalities, to other government departments, university libraries, school libraries, and non-government organizations, as well as politicians. Also, numerous requests for copies of the report were filled and continue to come in.

The framework for the 1985 report was rather traditional. It dealt with air quality, water quality, the issues of toxic chemicals, environmental management, human health, and conservation. It didn't do a very thorough job of describing the linkages between the ecosystem and the data that were presented in the report, and there was no emphasis on "stress-response". These are all considerations that have developed with recent experience, but at that time we did not have the benefits of that experience.

Information for the 1985 Atlantic Region Report was gathered from all of the sources that we were aware of and that could be contacted easily. They included provincial agencies, other government departments, and universities. Some areas, however, were not thoroughly treated, such as agriculture or forestry. The report certainly had a bias toward the environmental protection mandate with its focus on environmental pollution.

For your information, our best estimates show that the cost of publishing the 1985 Environmental Quality report was approximately $30,000.

Evaluation of 1985 Report

One of the important things that was realized following the release of the 1985 report was that it needed to undergo some sort of evaluation. We needed to know whether it had reached the audience that we had expected it to reach. The report was aimed at the general public but, obviously, when we started to assess the nature of the report: the size, the wording, the language, and so on, we felt that it may have missed the intended target. An evaluation was needed for improving future reports and to look at the adequacy of our marketing and distribution arrangements. Some information for the evaluations was obtained from the letters that came in after the report was distributed. Also useful were the requests that came in for copies, and media coverage at the time the report was released. We also made an effort to try to get feedback by enclosing a mail-back card in the back of the report, asking readers whether the report satisfied their information needs and whether they felt there should be changes. Unfortunately, we only got about one or two dozen of these cards back, despite the fact that they were pre-addressed and postage-paid. It might have been more effective to have had the mail-back card near the beginning of the report rather than at the end. The readability of the text was also evaluated using the "Gunning-Fog" index of readability.

One of the most important parts of the evaluation was "round table" discussions with representatives from our intended audience: universities, school-people, NGO's, and government officials to determine their response to the report and their advice. Basically, the advice that we got was: keep doing this kind of reporting, broaden the consultation if possible, use a stronger ecosystem emphasis, look at the relationships, do more analysis, use more examples and case studies to bring the report closer to people's experience, and produce a better summary document. They felt that an index would have been useful, and they wanted more and better graphics. They felt we should use other reporting formats like videos, fact-sheets,

school-kits, work-books, and so on. All participants deemed it very important to distribute the report to the public free of charge. The main text of the report was written at a grade 8 to 9 level, which is equivalent to the text of a best seller which was roughly were we wanted the level of writing to be.

Evaluation of the report's usefulness determined the following. The media made significant use of the report. They used it as a reference, a guide for developing questions, and developing the background for reporting efforts. Universities used the report as background for regional studies and as a resource for some courses. The report has been used as a textbook in several university classes, and schools have used it as a textbook or as reference material from Junior High to Senior High especially in the Maritimes' Studies Program. Other government departments didn't seem to use the report as much as we thought they would, however, environmental non-government organizations used it extensively.

Plans for the 1990 Atlantic Region SOE Report

I would now like to talk about the 1990 State of the Environment Report which is presently in preparation. Fortunately we have the benefit of our earlier evaluation, and the experience of headquarters in Ottawa with the National Report and all of the thinking and information that has been passed on from that effort. We've certainly taken a quantum leap in thinking and planning for our next report. It should be more comprehensive, much broader, and have a better coverage and a better balance in its treatment of various environmental components. In order to accomplish this a broader consultation within the Atlantic Region was essential. The workload also had to be shared more broadly within the Department, so that all of the other parts of Environment Canada: Canadian Wildlife Service, Inland Waters, Atmospheric Environment Service, Parks Canada; could become involved in SOE reporting.

This involvement is coordinated through the Atlantic Region's SOE Coordinating Committee on which all parts of Environment Canada are represented. All participants have a role to play in the production of the 1990 Regional State of the Environment Report. Also this group coordinates input to the National Report through case studies, information referrals, etc. Another task of the SOE Coordinating Committee is to review and approve fact sheets, videos and other materials produced especially for SOE reporting purposes.

Other activities undertaken by this Committee include developing a formal action plan, establishing a way of collecting the data and the information, putting together guidelines for the Atlantic Region Report Series, and looking at how the report-writing will actually be carried out. Consultation is a very important part of this whole process; consultation with the provinces, the non-government organizations, universities, the general public, the other government departments, and, of course, the headquarters SOE unit.

The framework for the 1990 Regional SOE Report has been developed with advice and feedback from our audiences, with guidance from Headquarter's models, and a lot of thinking about the World Conservation Strategy. We obviously needed to include the ecosystem concept, an assessment of human activities and the stress they create on the environment. Stresses and the response of the environment, sustainability, economy and human health, are all aspects to be included in this report. The main central themes are the environment, economy and health, with sustainability, of course, as an underlining theme.

In the outline for the report, we initially establish the idea of ecosystem linkages and introduce concepts from the World Conservation Strategy. The regional resource base is then described in terms of the assets in their region: the forest, water, air, marine resources and so on. Then follows a chapter on stresses: the human activities, the uses of resources, and the

stresses that result from those uses. The next chapter we are calling "Diagnosis for Sustained Use", which is really the chapter that describes the quality of the environment in the region, or the state of the environment. That chapter is going to be a difficult one to deal with and I think we will approach it by holding a workshop to bring together a group of experts in the Region to help with the analysis necessary to write the chapter. The next chapter, "Partners for Sustainability" deals mainly with the three themes: the environment, economy and health. This chapter will explore the association or partnerships that can develop among these disciplines which might lead to a sustainable environment in the region. We will wind up the report with a prognosis for the 1990's; i.e. crystal-ball gazing, examining potential kinds of management initiatives which will be required, identifying data gaps and concerns that still need to be resolved, and also looking at new or emerging issues.

We have an extensive network to draw upon for writing about the regional resources and stresses. This network helps us to consult with other agencies, such as the provinces, other parts of Environment Canada, Fisheries and others as needed. The network has been set up carefully through letters from the Regional Director General in the Atlantic Region to all the resource agencies in the Region, including the universities and the non-government agencies asking them to participate in this particular process. The responses from them have been very positive and include a willingness to identify an SOE contact for that particular agency. It is up to individuals writing sections of the report to go to those contact people for specific information and data necessary to complete their sections. This sharing of information and data is something we very much depend on in the Region and it seems to be working out. We've had great co-operation from all of the constituencies.

Conclusions

In conclusion I would like to make two important observations: one, that regional SOE reporting provides a special analysis of local problems and issues which complements National SOE reporting and which is compatible with that reporting effort; and two, that there is an important role for the provinces in SOE reporting.

The Atlantic Region has shown that regional SOE reports can successfully fulfill the needs of local media, educators, NGO's, other government agencies and the public to have access to an accurate and comprehensive analysis of the quality of their environment. Detailed regional reporting is useful for them to make decisions and judgements that affect their well being and the health of their surrounding environment. In the Atlantic Region, for example, it would be difficult for some smaller provinces to deal with certain broad transboundary issues, such as Long Range Transport of Air Pollutants (LRTAP) or Marine Environmental Quality (MEQ), in a meaningful way. However, there are areas of strength where a provincially focussed SOE report would be very useful to provincial residents and local development, resource and health agencies. The added resolution of a more focussed provincial report could allow issues of particular concern to be dealt within considerable depth.

I am very much encouraged by the evident interest in SOE Reporting and the sense of cooperation which seems to pervade this workshop. I hope it will continue throughout tomorrow and beyond, because cooperation is an essential ingredient of SOE Reporting. The sharing of information and ideas which this workshop has allowed is certain to inspire new efforts in this important activity.

Peter Eaton is Chairperson, Atlantic Region SOE Coordinating Committee, Environment Canada

Discussion

Mr. Eaton told questioners the level of language of the 1990 report will be the same as in 1985, but the target audience will change. The overview will be aimed at

the media, schools and NGOs. The summary should be easier to read and more illustrated, being aimed at non-government organizations and a broader public.

In response to a question, Mr. Eaton said getting information from the public is difficult. It largely depends on NGOs and special interest groups. Earlier reports used public-opinion surveys to determine levels of public knowledge and concerns, but for the 1985 report it was found that information received from letters from the public gave an adequate picture.

Atlantic Region's success in SOE reporting is due largely to the fact that the unit responsible got involved and established early in the game, i.e. in 1979.

SOE REPORTING IN THE GREAT LAKES -- A BI-NATIONAL EXPERIENCE

R.A. (Tony) Hodge

Abstract

The Institute for Research on Public Policy in Canada and the Washington-based Conservation Foundation recently published the results of a joint project to review the Great Lakes system. This was supported by eight foundations and twelve corporations, as well as by concerned governments.

The governments of the United States and Canada signed the Boundary Waters Treaty in 1909 to establish the International Joint Commission (IJC), primarily to allocate water resources from the Great Lakes. The IJC quickly began to report on pollution, but nothing was done until industry itself began to monitor water quality. Control of degradation began in 1972, at which time a multidisciplinary group recognized that it was necessary to examine all aspects of the ecosystem. In 1978 the two governments amended the Water Quality Agreement but also formally entrenched an ecosystem approach as the guiding management principle for the Great Lakes system. Throughout the 1980s, a bi-national Great Lakes Community of scientists, government people, NGOs and concerned citizens has sparked enormous public involvement in concern for the Lakes' quality.

The main purpose of the report was to influence the policies of the Canadian and U.S. governments. In preparing it, the authors were concerned with whom they were writing for -- policymakers and the educated public -- but also when they were writing for -- the report would take five years to sift through the system and it should therefore try to address the public values likely to be current in 1992 or later.

Introduction

In September 1987, The Institute for Research on Public Policy (Ottawa) and The Conservation Foundation (Washington) jointly initiated a review of the state of environment of the Great Lakes region. Support for the project, the first in IRPP's new Sustainable Development and Environment Program, was received from eight foundations, twelve corporations, the Government of Ontario, and in particular, Environment Canada. The study results and main conclusions were released in October, 1989 to coincide with the 1989 Biennial Meeting on Great Lakes Water Quality of the International Joint Commission. The full report will be published in January, 1990 under the title Great Lakes, Great Legacy?

The project team included three Americans and three Canadians, all with diverse academic and professional backgrounds. Such an interdisciplinary mix is an essential characteristic of SOE reporting teams. Though intellectually powerful, it can also bring difficulties of communication that must be dealt with openly and fairly. I raise this point now to emphasize that the quality and richness of the final product is as much governed by team management as it is by skills of individual team members.

In the paragraphs that follow I'll initially provide an historical context and then follow with discussions of why we initiated our project, for when we were writing, and applying the "so-what?" test to our work. In a final retrospective look, I'll offer my current feelings about what we learned about the state of the Great Lakes environment.

Historical Context

In 1909, the American and Canadian federal governments signed the Boundary Waters Treaty, essentially an agreement to deal with the problem of allocation of boundary waters between the two governments. The International Joint Commission (IJC) was created as the principle instrument of this initiative. At the time, epidemics of cholera and typhoid had emerged around the Great Lakes and almost as an afterthought a clause was included suggesting that neighbours should not cause transboundary movement of pollution. That simple clause has led to a cooperative, bi-national approach to environmental issues in the Great Lakes region that is almost without precedent.

In 1912 the two federal governments requested the IJC, for the first time, to investigate and report on pollution of boundary waters in the Great Lakes. That study, published about 1915, pointed out severe conditions of degradation. Government took no action. In 1946, the second major set of studies on pollution was initiated, this time of the St. Clair River, Lake St. Clair, Detroit River, and St. Marys River. In 1948, this initiative was expanded to include the Niagara River as well. The results of this study were published in 1951. Again, major concern was voiced. Again, government chose to do nothing.

Interestingly, the private sector did take a tentative step. In the St. Clair area, home of the "chemical valley" on the Canadian side, an industrial environmental cooperative was created to monitor and respond to pollution problems in the river. It is now known as the Lambton Industrial Society.

In the late 1960s, for the third time the IJC initiated a series of pollution studies. This time, conditions in Lakes Erie and Ontario had reached such an appalling state of degradation that action did occur. In 1972, the U.S. and Canada signed the Great Lakes Water Quality Agreement (GLWQA) and a number of steps were initiated to curb the destruction of the Lakes and in particular to deal with the issue of nutrient enrichment and the related problems of eutrophication.

The 1972 GLWQA also created a comprehensive, multi-disciplinary study called the Pollution from Land-Use Activities International Reference Group (PLUARG) which resulted in the completion of 121 sub-studies and the conceptualization of the "ecosystem approach" to management in the Great Lakes system. It is the ecosystem approach that captures the connectedness of all elements of the ecosystem: air, surface water, groundwater, land, and all the living components they support. The knowledge that developed through these studies led, in 1978, to significant amendments to the GLWQA including a shift of emphasis away from a simple focus on nutrient enrichment and eutrophication to the broader problem of toxic contaminants. In addition, there was a formal entrenchment of the ecosystem approach as the guiding management principle for the Great Lakes system.

Now eighty years after the signing of the Boundary Waters Treaty, what can be seen from this history? It is a history of knee-jerk reactions with little action and even less anticipation. We are the architects of our own degraded environment.

Why We Set Out to Complete a State of Environment Review of the Great Lakes Region

The bi-national activities leading up to the 1972 and 1978 GLWQAs resulted in the creation of a distinct Great Lakes Community that took as its focus the natural region affecting the Great Lakes. It includes scientists who now meet formally through the International Association of

Great Lakes Research, government officials, non-government organizations, and just plain folk.

At an informal meeting that took place in the early 1980s amongst some of this community, the idea of a comprehensive SOE review was floated. It would be undertaken with full recognition that natural ecosystem boundaries do not generally coincide with political boundaries. It would be driven by the ecosystem approach. It would recognize that the study area was the original engine of the North American economy for both the U.S. and Canada, now a highly populated area where two countries would have to share in problem solutions as much as they both contributed to the causes. With the region now moving into a phase of rehabilitation, perhaps lessons could be spelled out that were useful for other parts of the world. More than anything, such a review was both timely and needed.

Two organizations came together to undertake the work: The Conservation Foundation (CF-Washington) and The Institute for Research on Public Policy (IRPP-Ottawa). Each brought its own agenda. The Conservation Foundation had completed three major state of environment reviews of the continental U.S. and had pioneered concern for the cross-media movement of contaminants. They had come to realize that too often, pollution control programs simply shift risks among air, land, and water, rather than reducing them and further, programs failed to take account of the cumulative effects posed by toxic contaminants in these media. The IRPP brought a conviction that the much-vaunted conflict between the economy and the environment was, in fact, a myth. In the long run, a healthy economy and environment must co-exist. Influenced by the 1987 report of the World Commission on Environment and Development, Our Common Future, the IRPP saw the Great Lakes project as an opportunity to explore economy-environment relationships at a regional level. As research progressed, the pursuit of both these approaches converged and became more and more mutually supportive.

Who Were We Writing For?

At project initiation, we set about considering our audience and identified policy-makers, the educated public, and those likely to most influence policy as our target. We consciously tailored our language to reach those groups. We considered the organization of various approaches to both our research and our final report - and we strained in our search for the ideal working outline.

These are natural and essential first steps. However, one less common element was consciously discussed by the project team. Our ultimate aim was to assist in the improvement of public policy, and decision-making. To do that, we recognized that with our start in 1987 and publication in 1989 or 1990, we would have to aim our work at values and conditions of 1993-1994 if we were to have a lasting impact. We attempted, and no doubt fell somewhat short of the mark. However, in trying, we consciously stretched our own time-horizons, hoping that in the process we would more effectively assume an anticipatory mode of thinking.

The "So-What?" Test

At the press conference that marked the initial release of results, a reporter appropriately asked "So what - I mean, what have you people said that we didn't know about? What have you done that's any different than anyone else?"

I think we did succeed in taking an important step forward in practical application of the ecosystem approach. We tried to identify and consider all components of the system and all of the stresses on the system imposed by human activity. And we tried to link that side of the equation with human decision-making. There's no doubt that in time, others will improve on our start. But a start it is.

Ours was a work in synthesis and while the synthesis was original, no individual component benefited from original

research. In spreading out on the table before us the pieces of the puzzle, a clear picture emerged even though individual components on their own could be seen as "contradictory." There-in lies the essence of the ecosystem approach.

About two-thirds of the way through the project a first draft report was developed. It forced initiation of an important process with the project team. It forced the development of a simple assessment of ecosystem conditions. In short order, seventeen common-sense indicators emerged to tell the story. The list is included as Appendix I where it can be reviewed directly by the reader. I will, however, leap to the seventeenth indicator, that of the state of the regional economy.

The economy, in the spring of 1989, was doing quite well. But what emerged as most important, whether the economy was sluggish or bullish, was that it became evident to us that any available assessment of economic conditions was totally uncoupled with environmental conditions. The estimates of rehabilitation costs for the region that emerged, turned out to be in the tens of billions of dollars, if not hundreds. These costs represent a hidden mortgage imposed by previous decades of industrial activity in which profit calculations, in the absence of environmental costs, have been falsely calculated. While the importance of this economy-environment linkage stared us starkly in the face, our approach was little more than exploratory in nature. The formal linking of these economic and environmental issues emerged as one of the greatest challenges yet to be addressed.

Retrospective Viewpoint

I ask myself at this stage, what are the feelings that I am left with. I raise this point to illustrate that there is a critical emotional element to state of environment reporting. This element is the foundation of communicating any lessons that might emerge, it is the foundation of any effective strategy put in place to reach decision-makers, be they the public in general or politicians in particular.

When I step back from our work, I am left with a heightened concern about the health of the environment. I come away certainly with a sense of urgency that we act now, not later, to prevent further degradation. However, equally powerful is a sense of optimism, diametrically opposed to those who would preach gloom-and-doom. This optimism doesn't come from the signals listed in Appendix I. Rather, it comes from the rapidly shifting values of residents whose home is the Great Lakes region. The unprecedented growth in their concern for the health of the environment is opening the door to shifts in policy that were never before possible. This shift, of course, is sweeping the world, and leads to an importance, greater than ever before, for accurate and comprehensive state of environment reporting.

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Discussion

In answer to a question about whether government or a third party should undertake SOE reporting, Mr. Hodge pointed out that if a report is to address policy explicitly, it would be difficult for government to be objective. Should SOE reporting, indeed, be objective or advocacy-oriented? Mr. Hodge suggested that the emotional element needs to be recognized: people remember the feeling, not the facts. We must be willing to recognize, listen to and express our instinctive feeling about how good or bad the environment is. At the same time, optimism is important and should be given due recognition.

APPENDIX I

Indicators of ecosystem health trends in the Great Lakes				
	FACTOR	**RESPONSE TIME**	**BASIN LIMITED?**	**CURRENT STATUS/TREND**
A.	**Concentrations of Contaminants in Specific Media**			
1.	air quality	days-months	no	uneven progress; conditions periodically unacceptable in major cities
2.	surface water quality	months-year	yes	general improvement experienced since the 1979's; exceptions with some contaminants and in some local areas
3.	contaminated sediments	decades-centuries	yes	generally stable or improving; some exceptions in local areas
4.	groundwater	decades-centuries	yes	degenerating; system ill-understood
B.	**Fish and Wildlife**			
5.	body burdens of toxics	intergovernmental effects documented	no	improvements in the 1970s; trends now variable and inconsistent
6.	population status	years-decades	no	variable
7.	habitat	days-centuries	no	slowed rate of loss and deterioration; many critical areas still threatened
8.	species diversity	decades-centuries	no	some species threatened
C.	**Terrestrial Vegetation**			
9.	health of plant communities	months-decades	yes	little monitored; geographic specific; clearly some concerns
10.	species diversity	months-decades	yes	some species threatened
D.	**Land**			
11.	conversion of high quality agriculture land to urban uses	days-years	yes	overall loss continuing; loss per capita decreasing; limited local but not general problem

12.	soil productivity	years-decades	yes	generally stable
13.	soil erosion	months-decades	yes	continuing natural erosion; conditions generally stable compared to other parts of North America
14.	shoreline erosion	days-years	yes	continuing natural erosion; inappropriate use of vulnerable shorelines continuing
E.	Human Characteristics			
15.	human health	days-generations	no	little indication that the health of adults due to toxic contaminants is being compromised; certain sub-groups at elevated risk; growing concern for subtle chronic and intergenerational effects
16.	economic vitality	months-years	no	U.S./Canada differences; generally healthy; local soft spots; spring, 1989

PANEL PRESENTATIONS

A panel session designed to stimulate general discussion on the previous presentations involved representatives from non-government organizations. The three panel members represented the perspective from industry, the education field and environmental NGOs.

Industry Perspective: Hugh Eisler, Stelco Inc.

The Stakeholders Group established as follow-up to the 1986 national SOE report made several recommendations in March 1987. These urged that a long- term plan is necessary for collection of environmental information, that dollars are needed, that a responsible agency is necessary, that an advisory council should be established and that SOE must have a complete range of objectives and should include strong educational efforts. In fact, the first public advisory committee on national SOE reporting was established in 1988. Industry strongly supports SOE reporting, to provide the foundation for discussions with different groups and to determine what should be done. The main message is KISS: keep it simple and scientific. It is important to obtain a broad cross-section of available data and plot trends over time. There were a few graphics in the 1986 SOE report but not enough; we underrate the power of visual images.

Indicators have to be chosen carefully. Inputs to the environment should not be equated with the state of the environment. We need to know all the stresses over a broad range, to coordinate all the information from all jurisdictions available and then look at where the gaps are.

The SOE Public Advisory Committee has grown with Statistics Canada and Environment Canada. It has agreed on report goals and been effective through having more attention paid to trends, defining audiences and making SOE reporting more user-friendly.

Education Perspective: Ken Denike, University of British Columbia and Vancouver School Board

From the perspective of the public education system, the main considerations are where and what type of information is used. The elementary and high schools are most important as these provide the greatest opportunity to develop ideas and values.

Information for grades 5, 6 and 7 should include concerns for the interdependence of the environment and the economy. Three basic categories of curriculum material are information on environmental resources, education kits from the ministry, and ecology and environmental systems information.

Junior secondary grades study mainly resource ecology, where they consider the relationships of systems and the processes leading to decision-making. Senior secondary levels study science and technology as well as socio-economic perspectives; here the students are challenged to look at environmental issues.

In general, there is the need for a stronger database of information that can be put into a form useable by students. Much of the scientific material generated by SOE reporting does not include the type of decision-making information that the educators would like. It is often difficult for those charged with curriculum development to discern what is important to the schools in scientific material. Industry information is used in schools because often the documents have been written by somebody with an education background, which makes the documents more accessible.

Dr. Denike suggested that it is not the role of other government departments to provide information in a way accessible to educators; that is the responsibility of the Ministry of Education.

Environmental Interest Group Perspectives: Tony Hodge, Friends of the Earth

First, SOE reporting should take an ecosystem approach. Even though water quality might be improving in the Great Lakes, bioaccumulation and biomagnification of toxic chemicals in the food chain remain serious problems. It is necessary to examine all components. Analysis of the state of the environment is moving to a mass-balance approach because causes of environmental stresses, such as long-range transport of air pollutants, are not confined within a region but move between regions and even continents. We must stop picking up only the popular issues and begin to take a more holistic approach.

Second, it is inevitable that expanding knowledge will lead to more uncertainties not less. We need to put people into new time perspectives, to emphasize the importance of thinking of future generations. Indian legends speak of looking after the "seventh generation"; we should be following this lead.

Third, the need for public participation in decision-making and the need for more funding for non-profit groups cannot be overemphasized.

General Discussion

Public Involvement. The discussion on public involvement addressed the use of the public's knowledge, whether observations or historical perspectives, in SOE reporting. One approach has been to ask NGOs to contribute the knowledge and beliefs of their constituents.

Fifty public interest groups were involved in the Hamilton Harbour Remedial Action Plan and had good input. The process was very successful, especially with regard to setting objectives and use-goals. One problem, however, is that the public finds it difficult to focus specifically on the issue at hand.

One reason that public involvement can be important is that often one must live in a region to understand the depth of data that are being gathered. However, it was suggested the public is not accustomed to designing solutions and acting on them. A big problem is that most environmental issues are bogged down in technical jargon. It is also difficult to get members of the public to say what they feel.

Does this mean the public is "taking over" asked a participant. One reply was that a survey of the communities in the Fraser River Basin revealed that NGOs are taking on increased stewardship responsibilities for the resources.

It was noted that the federal SOE Public Advisory Committee proposes to discuss community involvement in SOE reporting at its next meeting. Toronto, Montreal and Ottawa have done community-based SOE reports. In Ottawa, the report is being done by the local community, not government; this raises the question whether another level of SOE reporting should be considered.

It was suggested that public-interest groups could take part in the process through analysis of reports or asking questions about the contents. SOE reports are not the final product; other groups have to analyse them and then develop action accordingly.

The media filter information to the public, noted one delegate. It is a tremendous resource. We need to change their (journalists') attitudes and decrease the degree of sensationalism. To get to the public, we also have to work more closely with the educators.

A Fisheries and Oceans delegate said the department invited reporters to a meeting and it was very informative to hear what drives reporting.

Public Advisory Committee for SOE Reporting. In discussion on the federal Public Advisory Committee, one observation was on the need for a distinction between expert and public advisory committees. For Statistics Canada, public participation was a new experience; there isn't the same depth or knowledge in

a particular area with the public, but it ensures a program is serving the needs of the broad spectrum. SOE reporting may need more of both expert and public input.

Environment Canada felt that the experience with the SOE Public Advisory Committee has been very positive and has greatly contributed to SOE reporting.

Objective Reporting versus Advocacy. Given the need to offer increasingly proactive reports, to identify the problems and list examples of actions that can be taken to deal with them, a delegate suggested that we all try to play the public role and see where it leads. A member of the public would likely ask: what is the problem and how can I do something about it?

The topic is germane to preparation of the national SOE report for 1991. There will be a change in presentation, in that the report will look at current and emerging decisions and outline management responses. For example, six examples will show what governments and individuals are doing. The federal SOE reporting unit is getting lots of enquiries from the public, so it will need to be prepared to send out information about the environment. There is a need to help people understand that the problems are surmountable.

Participants were divided on the question of advocacy. One delegate stated plainly that SOE reporting should stay out of the advocacy role to keep credibility. Another view was that it is inevitable that successful SOE reporting will have an element of advocacy in it. The type of report depends on the source. If it is an internal government report, it might have a limited scope. If it is an independent report, it might have a broader scope and can afford to criticize the minister. SOE reports have different roles in government and outside of it -- these roles are different, not better or worse.

As for credibility, the real world is full of people who have judgements about traditional sources of information. If people aren't part of the process, it won't be credible. Governments are too objective, one speaker said. They should offer more solutions.

An example of how to deal with subjective matters was the action in 1986-87 of the International Joint Commission, which called for studies to ascertain "how clean is clean?" There were various viewpoints. A consulting engineer said clean is when we meet industry standards. The coordinator of one stakeholder group said clean is when we can swim, fish etc. From an ecologist the answer was that we should rather ask: how healthy is healthy? And a water chemist said we need maps and indexes showing chemical levels.

Access and Timeliness of Information. It was suggested there is a danger in oversimplifying lists or indices. How far does right to know extend? If governments are giving information out, they need to know when to draw the line. However, an NGO viewpoint was that even though releasing information can lead to problems, it is best in the long run to give out as much as possible.

It is important to take into account the rate at which things are happening, a participant observed. Reports have long lead times, and values are changing rapidly. Perhaps it is necessary to start thinking about changes within shorter periods. This led to a comment that what is needed is writing that would capture the essence of the problem, the numbers (data) to be added later. Already, institutions are changing to deal with the reporting time lag, said a delegate -- we can't expect what we do today to meet our needs five years hence.

IV APPROACHES TO SOE REPORTING

Approaches to carrying out SOE reporting were dealt with in small working groups. Participants were divided into five groups, each of which was asked to discuss certain questions for 90 minutes. The questions covered three areas: communications and decision-making (two groups), analytical tools and methods (two groups) and institutional arrangements (one group).

Chairpersons presented the groups' conclusions at a plenary session after the workshops. Questions and summaries of the discussions are presented on following pages.

COMMUNICATIONS AND DECISION-MAKING

The objective was to define priority users and objectives of SOE reporting. Questions were:

- The following range of user groups has been identified for SOE reporting: the public, media, politicians, NGOs, educational institutes, governments, industry, the research community. On whom should we focus and why?
- How do we identify the needs of these users and what are these needs?
- Why do we want to report on the state of the environment? For education purposes? To promote an environmental ethic? To serve a real demand for analysis and information? To serve people making decisions and creating policies?
- What is the role of SOE reporting and what approach should we take? Should we be absolutely neutral (facts only)? Should we analyse and perhaps make predictions based on scientific evidence? Should we take more of an advocacy position and include in our reporting some recommendations for action that ultimately close the loop between problems and solutions?
- Why types of products are required to meet these needs?
- How do we communicate to our audience what it is we are reporting on?

The results of discussion on these questions are summarized below:

User Groups and Their Needs

Three key user groups on which to focus were identified: the media, the educational community and top decision-makers such as deputy ministers and assistant deputy ministers in government and chief executive officers in industry.

In identifying the needs of these users, the workshops recognized the need to break down traditional perceptions. Needs can be identified through focus groups and surveys and by talking to people. The primary need is accessible and relevant information for people in government and business and for the public.

Media briefings could be held and advance notice of reports and events given. Increased cooperation with media people would see them involved right from the start in any development.

Concerning the educational community, it is very important to change children's attitudes if we are going to effect change. For example, students could do their own mini-version of an SOE report, possibly through a contest; schools could get involved in collecting samples for acid rain or cleanup programs. Participants recognized, however, that SOE reporting is only one tool among many for educating the public and officials. Also, those who prepare SOE reports cannot be directly responsible for developing materials for schools.

Top decision-makers in government must be provided with information to meet their political needs in a timely fashion; for instance, if PCBs are becoming a hot topic, the ADM should be provided with information. Interesting factual information can be supplied to speechwriters.

Top decision-makers in business must be persuaded that protecting the environment makes good business. There should be topics in SOE reports that correspond with their interests. In addition, working relationships between business and SOE-reporting agencies must be developed. This might be facilitated by providing economic data that outline economic aspects of the environment. Businesses have to understand the cost-implications of industry and environment relationships. Success stories could be documented – about companies that have done a good job environmentally, for example.

The workshops agreed that the public should be involved in the preparation of reports. Examples of this include: the Green Census in Japan, where the population is directly involved in data collection; the program in the St. Lawrence to assess the quality of fish; and the Ontario program, where people collect water samples. This increases the visibility of SOE reports. In increasing public participation, it is best to use existing networks, such as the school system. Participants recognized that enhanced public participation is easier at the provincial level than at the federal level.

Goals of SOE Reporting

General aims for SOE reporting include linking the environmental administrations, linking with other administrations and linking with the public. SOE reporting is a tool that enables administrators to see where the department is going and enables the public to understand. It is not expected to develop management options but does help decision-makers devise a management plan; it is not up to SOE reporting to tell people what to do.

Role and Appropriate Approach for SOE Reporting

SOE reporting should appropriately present information, analysis and interpretation, evaluation and advocacy. This is seen as an evolutionary process. It is important that governments get the process started and get some information out, even if they are not sure about objectives or criteria.

Analysis and interpretation may be partly done within government, but outside groups should also be involved.

Evaluation was seen as something that must be done outside government; government should maintain an equilibrium. Advocacy will be taken on by interest groups, perhaps with some government help.

The importance of maintaining credibility through external auditing was recognized. The public will be suspicious of anything produced by government, so it is important to be seen to have outside evaluation. Credibility is also important to ward off the NIMBY (not in my backyard) syndrome. A strong review process will bring everyone in. Also, the area of SOE reporting is so new there are bound to be mistakes. Consultation at all stages is necessary. Opposition parties will always do an audit.

Types of Product

Some audiences (the media and schools for instance) want only a fact sheet or summary, which can be extracted from SOE reports and changed to serve a variety of audiences, from university researchers to "people who don't have time to read." Others will want more detailed information with tables etc. In general, there could be a fact sheet for quick reference, a summary for decision-makers and a comprehensive SOE report for those who seek more detail. Other forms include video and computer products. Ideally, a family of products is needed, each component developed for a particular target audience.

Synthesis products would include summaries distributed by different government departments according to the issues that concern them. Regular issue-specific reports could come out annually, using the resources of different departments; summaries of these synthesis products could be put together every five years to produce a comprehensive report.

Standardized products would eliminate the need for a new format for each stage of SOE reporting. With these, the body of the text could be preproduced, and the data dropped in as collected. This would not only conserve resources for data collection, it would help standardize products within provincial governments and between federal and provincial levels.

Audiovisual products would include commercials (effective but expensive) and videos for education. As we enter the 21st century, we need to begin to use communication tools other than just reports. Television programs could be considered as an integral part of SOE reporting. Produced in partnership with production companies, they would be a good way to present information. For instance, the BBC produced a television series in conjunction with the Brundtland Report. Data products such as information in public-domain computer databases or on disk would be popular.

Environmental indicators is so complex an issue that there should be another workshop on them. All the provinces would benefit if the federal government wrestled with this topic.

It is important to consider how SOE information can be interpreted to make it more accessible. Currently, reports are so big that the general public and the media tend not to use them. Also, a release strategy is required. In 1986, Environment Canada did a whole media package and this worked surprisingly well. But it costs a lot of money.

There is a need for an international distribution network.

Reporting to Our Audiences

Communications should be part of the planning; there is no sense in producing a product that the public won't accept. Accordingly, decisions about what kind of output we want should come through a process of public consultation from the beginning. Decisions as to what would go into a table of contents would be determined according to the target group.

Linkages with communications groups are necessary. Governments can produce the initial material then encourage other organizations (possibly with financial help) to communicate the information to their members. This would ensure that the information is communicated in an appropriate manner, and also conserve government resources. Also, it would help to standardize the product.

SOE reports need to be marketed. This requires expertise and money, and bureaucrats need to be less passive and more aggressive about getting the SOE message into people's minds. Why not, for instance, send SOE information to two houses on every city block, much like businesses and magazines do?

Partners can also take part in the dissemination process. Other government departments and NGOs can be used to communicate with their constituencies. This would involve all relevant departments and help to reduce interdepartmental conflict.

General Recommendations

The workshops made two general recommendations:

. Make the information useful, relevant and explicit. People have to know what is in it for them.

. Once each target group is identified, have a mechanism for adapting the information for each user group.

ANALYTICAL TOOLS AND METHODS

The objective was to identify and explore different tools and methods that can be used for SOE reporting. Questions were:

- Various approaches such as environmental media, resource sector and environmental issues, and various analytical frameworks based on political, watershed and ecosystem boundaries have been used as means of structuring SOE reporting. What are the pros and cons of each, vis-à-vis users' needs?

- There are various tools that can be used for reporting on state of the environment (for instance, monitoring systems, databases, geographic information systems etc.). Are these adequate? How can they be improved and/or expanded on?

- One of the unique characteristics of SOE reporting is its comprehensive, integrated-analysis approach (including links between health, environment and the economy). What elements, processes and tools are required to achieve this type of approach? How do we go about this integration? What are the needed first steps?

- The concept of national environmental indicators has been promoted by our Prime Minister at the recent Economic Summit in Paris. What is the role of indicators in SOE reporting and how should they be developed?

- Environmental information is at present available in a variety of forms in various jurisdictions across Canada. Is there a need for a Canadian SOE information system? If so, what should it include, who should be involved and how should it be developed?

- What are the challenges that have to be overcome in such an SOE information system -- for example, data availability and consistency?

The results of the discussions on these questions are summarized below.

Structuring SOE Reporting

Examination of approaches taken by Manitoba, Canada and the Centre Saint Laurent (Table 1) suggests there is no one right approach to SOE reporting. The approach has to be well-honed to the audience and to the objectives of the reporting process.

A combination of approaches is typically required; not a hybrid, but different approaches under the same cover. For example, Manitoba is taking a comprehensive or "global" approach, along with focusing on a particular issue -- hazardous wastes. Different approaches are not mutually exclusive; the appropriate one varies with the environmental medium and the concerns of the day. An issues approach will best reach a wider audience.

Similar combinations of spatial frameworks (ecological units versus administrative boundaries, for example) and products (such as one large report versus several interim reports) may also be desirable.

Any approach must use existing data; we do not have the luxury of being able to create new databases in the short term.

Adequacy of Current Tools

Should SOE reporting depend on geographical information systems (GIS)? The development of GIS is expensive, and coordination is difficult. There will be no SOE in Alberta if it requires a GIS. Databases on the Prairies are quite good for water quality and volume, hydrometric indicators and urban air quality. Tangible data links between environmental and human health information are difficult to establish.

SOE reporting is not GIS-dependent but GIS technology is synonymous with integration; we are trying to increase our understanding of interrelationships. To produce meaningful information for decision-makers and the public, the data we have must be analysed, but we have not been able to interpret it adequately and we are

TABLE 1

EXAMPLES OF APPROACHES TO SOE REPORTING DISCUSSED IN THE WORKSHOPS

Manitoba:

- A combined approach for 1991 report because the province has several objectives. Trying to be global but also has a political agenda to deal with hazardous waste management. Subsequent reports will likely also deal with specific issues. Recurrence of an issue would depend on how important it is perceived to be. Bottom line is flexibility. Inter-departmental committee was able to list half a dozen issues that the report could have covered.

- Single report but different formats: e.g., Education Dept. representatives on the Advisory Committee are developing an educational package. A video will also be produced centred on the 'sexy' issue (waste management) as video is a good medium for dealing with it. Each medium lends itself to different aspects of the SOE report.

- Ecosystemic approach will be used to look at physical resources whereas socio-economic analysis will be based on 3 spatial categories: North, South, and Winnipeg. Match between socio-economic and physical resource boundaries is very good (approx. 85%).

- The economics chapter will be broken down into the different resource sectors and then into different resources (e.g., terrestrial resources). The socio-economic section is the most problematic. It is the most issue-oriented. Where do we stop? This is not a 'state of life' report. Where do we draw the line?

Centre St. Laurent:

- Have a 5-year action plan. Do not want to depend solely on a final report as then the public tends to expect too much in terms of predictions. With the restricted time frame, there is not sufficient time to produce a report that will satisfy everyone. So they have developed a 'Table of Contents', and as the information comes in, will get it out as soon as as possible. This allows people to use the information immediately. Emphasis on what we know most about (what there is data about) and what interests people most.

- Centre is also identifying different types of products, such as an Environmental Atlas of St. Lawrence. But it will still distribute maps as soon as they are finished as well as compiling them into a book. For universities, scientists, fact sheets will be produced. For the larger audience, issues/journalistic approach will be taken.

- Spatial framework is very tricky. The best approach is an ecosystem approach, but in this case cannot just take the municipalities. Once again, framework depends on objectives: for whom are you producing the report?

National SOE report:

- Comprehensiveness is very important. Breaking the framework up by environmental media, components tend to be increased but eliminates contributions of humans. Breakdown by resource sector is also not comprehensive enough from a federal perspective. Many issues can be comprehensive (e.g., acid rain, global warming).

- Combination approach seems to be the most flexible. Can have hybrids of different approaches or use different techniques within the same cover. Important to try to identify when each different approach is useful. Spatial frameworks are easier to understand. Much data is available by socio-administrative boundaries.

- Environmental components are available, but not in relation to socio-administrative data. Ecosystemic approach is the ideal but little data available for it. The next best thing is to combine administrative boundaries with environmental boundaries and components. Environmental components cannot take advantage of socio-economic data available.

accordingly data rich, but information poor.

Specialists collect data to understand specifics, and it is difficult to get them to look at the big picture. We must establish early in the process whether they will be able to see the big picture with the data available to them. There must be a compromise.

Databases are inadequate, but because we cannot overnight develop more appropriate capabilities we must be opportunistic and use what is available. Over the long term, SOE reporting will help us shape the monitoring that is carried out.

Current indicators, we must be aware, are proxies for more appropriate indicators of environmental health that have yet to be developed. Here, the concept of evolution is important. We will need to modify networks and databases because of changes in our reasons for measuring data in a certain way and in certain locations. As the indicators we use change, we will have to explain those changes to the public.

We must be clear about the values that SOE reporting reflects. The tools are only adequate if they reflect clearly described values. There may be a tendency to spend too much money on data collection and analysis and not enough on understanding values -- perhaps because we do not measure values very well. For instance, in developing land and water strategies, Manitoba spent time asking people what they wanted in an effort to establish what their values are. It is necessary to establish what is important to the public and collect information on it.

Analytical Integration Among Health, Environment and Economy

Are we progressing toward a quality-of-life report? When we attempt to integrate the environment, the economy and human health we have a very broad mandate; the report is no longer environmental. Non-scientific groups must lead, something we see in the round table approach.

Given the increasing emphasis on socio-economic factors in SOE reports, what are the boundaries of these reports?

We need to go cautiously in making linkages between the environment and human activities, particularly health. Revelation of unsubstantiated cause-effect relationships can do a great deal of damage to public confidence and our ability to do future SOE reporting.

In the short term, we lack knowledge of interrelationships; we can only present concerns and different ideas. Meanwhile we should build an infrastructure to help promote better understanding.

There is a need for better integration of different specialties, perhaps through multidisciplinary teams.

We must link science and decision-making; research institutes must relate to the people who make decisions at the top. SOE reporting should bring research institutions on board to direct research and develop better understanding of interrelationships.

The Role of Indicators and Their Development

Politically this is a very attractive concept, but it can also be dangerous, inasmuch as there may be bad data and the measures may be as meaningless as some economic indicators are. There are, however, some desirable characteristics that indicators might have:

. They should be scientifically defensible; scientists and academics should be neutral.

. They should be developed with input from the public.

. They should not be set in stone but be flexible and refinable. Indicator development is an iterative process; it is very important to put the indicators in place even if they are not perfect. They can then be discussed.

- People must be able to relate to them (for example, the windchill factor and the humidity index indicate to people what clothes to wear; by contrast hardly anybody understands money supply indicators). SOE indicators should be understandable at a Grade 10 level.

- They must demonstrate the positive and negative effects of human activity on the ecosystem or on human health and indicate to people how they may help the environment.

- They should be value - or application - oriented.

Different indicators will be required for different purposes and different audiences. What we need is not one key set of indicators but rather a varied set.

At the same time, it is important to create a core set of basic characteristics that would assess the vitality of the ecosystem and would be collected by all jurisdictions using standard methods and processes. This core set should be created by a new national committee.

A Canadian SOE Information System

There is no doubt that we need a nation-wide SOE information system, preferably of the matrix type.

Environmental reporting is cross-jurisdictional; we must be able to deal with regions that encompass more than one political jurisdiction. We want information as Canadians, then as residents of a province and finally as residents of a region. Only problems are created if data are restricted to jurisdictions. Cooperation is important.

Hence, there should be a national referral system for SOE reporting statistics to which all jurisdictions would contribute and which is developed jointly by Canada and the provinces. Whether the federal government would be responsible for maintaining this baseline would have to be decided.

A centralized data system would hold different information for different scales, to produce a national referral system for SOE statistics. Contributions from all jurisdictions would feed this database, although a central institution such as Statistics Canada would be responsible overall for gathering data. It would need to be emphasized that the centralization is for information gathering and not decision-making. Some consideration also must be given to the role of Canada in the international arena.

What information would such a central SOE system hold? SOE reporting is not just environmental information; it also describes the interface between human well-being and ecosystem well-being and the relationship between these and human activities. "Human health is not just the absence of disease; environmental health is not just the absence of degradation." Also, economic activity is not always the same as human activity.

We must develop a core set of basic characteristics to assess the above and encourage development of standard methods for collection of information.

Challenges to be Overcome

The challenges to be overcome in an SOE information system include the availability and usefulness of data and the consistency of data from jurisdiction to jurisdiction. There must be communication between jurisdictions before collection. Other challenges include marketing the product, the possible lack of common understanding, the differences in natural and human systems and the need for compatibility in hardware and software. Different styles of reporting call for flexibility in an SOE system.

There need to be institutional arrangements to develop information systems and indicators that serve the needs of both Canada and the provinces. Suggestions for these should go before either the Canadian Council of Ministers of the Environment (CCME) or the First Ministers Conference. A national Round Table might be created to deal with the issues.

INSTITUTIONAL ARRANGEMENTS

The objective was to identify necessary institutional arrangements within and across jurisdictions to provide for effective SOE reporting. Questions posed concerning internal arrangements were:

. Is a specific legislative authority or Cabinet directive necessary to undertake SOE reporting? Can it be incorporated in existing authorities (legislative, policy etc.)?

. Is a special program required for SOE reporting or should existing processes be used (for example, extension of the Ministry's annual reports, Round Table annual reports)?

. To fulfil the SOE reporting function, is it necessary to form a special unit dedicated to SOE reporting, or can this new responsibility be accommodated through existing structures? What are the various pros and cons of special units versus secretariats versus use of existing structures or coordinating committees?

Questions posed concerning external arrangements were:

. Effective SOE reporting requires the cooperation of many agencies among jurisdictions. What mechanisms are in place or can be used to gain the necessary support to do effective SOE reporting at regional, provincial/territorial and national levels (for instance, the Round Table on Environment and Economy)?

. SOE reporting must be scientifically credible and publicly understandable. What mechanisms should be put in place to ensure this happens (for example, scientific or public advisory groups)?

. What mechanisms are required to ensure that SOE information is accessible to stakeholders and the public?

The discussions on these questions are summarized below.

Specific Legislative Authority

It is necessary to have legislative authority so that adequate resources can be allocated. Agencies, in allocating resources, usually give priority to explicitly legislated mandates. Enshrining a function in legislation, that makes it explicit that adequate resources will be provided, ensures it will be done.

However the legislation should be flexible; one disadvantage of legislation is that it can put an agency's back to the wall in the sense that it mandates too inflexible a requirement.

The options are either to legislate authority for a specific agency or to pass umbrella legislation cutting across several ministries' mandates. Authority also can be incorporated into existing mandates.

Time frames for allocating resources and producing results are important; two years is too tight, five too long, unless there is interim reporting. The reporting of data must be linked to the delivery of necessary information -- from Statistics Canada, for example.

Special Program or Use of Existing Structures

It is useful to have a special unit in the beginning until SOE reporting is well established and accepted.

Having a special unit within a line agency is preferred -- at least in the beginning, to "nurture" the SOE reporting process. An independent agency may be desirable in the long term, however, as it may be more able to extricate the reporting process from other departments (to overcome the mandate "baggage") and thus exercise greater freedom to draw on the scientific community and other interest groups to determine human values.

The process must have people who are designated to specific tasks rather than trying to do this work along with other day-to-day tasks.

Quality control is critical to credibility. The unit must be able to reject products and to call on expertise as needed for knowledge and critical evaluation.

Alternatives to whom to report include the Minister of the Environment, a Cabinet committee, the First Minister or the legislature or Parliament directly (as happens with ombudsmen or the Auditor General).

Mechanisms to Gain Support at Various Levels

Options for regional, provincial and territorial SOE reporting include the Round Tables and regular interagency workshops. Having staff seconded to the SOE agency will generate enthusiasm. Should the SOE agency have sufficient fiscal resources it could provide incentives to line agencies. Politically, a mandate and support from the Cabinet would be valuable.

Nationally, endorsement and support from the Round Table on Environment and Economy is valuable, but Round Tables are not the correct vehicle to ensure cooperation. Initially, support from the CCME is important, but not through a research advisory committee, as the function of SOE reporting is not just research. Over the long term, we need a new, integrated, resource-management committee under the federal, provincial and territorial ministers.

Mechanisms to Ensure Scientific Credibility and Public Understanding

Scientific credibility does not rule out anecdotal information. Oral histories may be the best scientific information available. Mechanisms to ensure scientific credibility include independence of the agency, expertise in the natural- resource sciences, a high level of communications skills and reviewing -- by an advisory group, by informed publics and, in the scientific realm, by peers.

Scientific and public credibility will be ensured more by the attitudes of the people involved than by institutional safeguards. People of good will can make the worst process work. People of ill will can sabotage the best conceived processes.

V STRATEGIES FOR COOPERATION

Strategies for cooperation in SOE reporting were also dealt with in a working group format. Participants were divided among four groups, each of which was assigned questions. The questions covered five areas: the reporting process (two groups), data/information (two groups), environmental indicators (two groups), communications (two groups) and actions required (all four groups). The last question was essentially a request for recommendations for an action plan or steps to be taken to move SOE reporting forward in Canada. Some groups focused on this request rather than dealing with all the suggested questions.

Chairpersons presented the groups' conclusions at a plenary session after the workshops. In general, all groups agreed that cooperation is not only desirable but essential for all aspects of SOE reporting. There is a greater need for cooperative SOE reporting in areas where there are overlaps in jurisdiction (such as Atlantic Canada, the Gulf of Maine, the Great Lakes and the St. Lawrence). They agreed that the ecosystem approach, already widely discussed by those present, demands cooperation at many levels.

Questions and summaries of the working group discussions are presented on following pages.

THE REPORTING PROCESS

Questions were:

. SOE reporting is carried out by various levels of government in a number of jurisdictions, and various agencies have environmental responsibilities at all levels. How can we all cooperate in this process of SOE reporting?

. Are there ways in which all governments can work cooperatively in their efforts to involve NGOs and the public in SOE reporting?

. We would like to build on the evolving efforts to cooperate with the provinces and territories in producing the 1986 and 1991 national assessments. How can this be achieved? Through what mechanisms and approaches?

The results of discussion on these questions are summarized below:

Ways to Cooperate Across Each Jurisdiction

Regular meetings and workshops should be held so all can benefit from experiences at all levels of government. Workshops and informal brainstorming sessions might be the best mechanisms within provinces.

Federal newsletters should be circulated to provincial groups. Asking provincial and territorial reporters to cover environmental events in their areas would make a newsletter truly national. It would be useful if one comprehensive mailing list was compiled from all federal and provincial lists.

The timing of reports should be coordinated to maximize impact. Manitoba produces SOE reports every two years and relies on census data, but the census is only every five years. This means the same census information is likely to appear in succeeding SOE reports. Better timing means we could take advantage of the most up-to-date information.

Perhaps more questions could be added to the census and other surveys to facilitate information gathering.

Ways to Cooperate in Involving NGOs and the Public

Existing NGO networks should be used and development of new networks should be encouraged. They can supply good information and help link with the public. NGOs could review the text of reports and help increase distribution of texts and materials.

Public advisory committees are essential. They have been very successful federally, allowing as they do for representation from all sectors. Manitoba plans to use such a committee for its SOE report, but has had difficulty deciding who should be on it. The OECD has working contacts with NGOs but they are not used in a systematic way. Public advisory committees are also a good way to get all regions and areas represented.

Ways to Cooperate With Provinces and Territories on National Reports

Formal and informal mechanisms for reviewing input to SOE reports should be developed. These could be in the form of Round Tables, although often Round Tables have too broad a mandate for them to be very useful.

DATA/INFORMATION

Questions were:

. Identifying and obtaining information for SOE reporting is problematic. Are there existing vehicles (a referral system, for example) that we can use to improve accessibility? Are there new ones that should be initiated?

. Several jurisdictions have expressed an interest in data sharing. Is there a common approach by which this can be achieved?

Results of the discussions on these questions are summarized below:

Vehicles to Improve Data Accessibility and Data Sharing

Each province could attempt to identify existing data sources and also identify gaps -- in Ontario, for example, data are highly fragmented amongst the Conservation Authorities.

We should try to centralize data within each jurisdiction, but this should not be tied inextricably to the SOE reporting process. This centralized data bank can serve many other purposes.

As an interim step, we recommend that each province form a working group comprising data experts and others from a variety of sectors (not necessarily scientists but people who can appreciate the potential applicability of data) to work together to develop a centralized data bank or data profile.

There is the issue of confidentiality. Industry may have data that companies do not want released. It is essential that such information is separated from the rest. If this is not done there is a risk that large volumes of data will become inaccessible only because a small proportion of it is sensitive or thought to be potentially so.

Data collection is often the first thing to be cut when the budget tightens. Research is very much tied to the economic climate. Unless there is a commitment consistently to pursue the collection of data then this activity may well be cut.

Costs are a problem. Statistics Canada follows the user-pay system; what do provinces do if they want data but can't afford it? A special relationship might involve a memo of understanding that would promote a networking arrangement

There is a role for industry and NGOs in the supply of data.

ENVIRONMENTAL INDICATORS

The question posed was:

. A number of jurisdictions are interested in developing SOE indicators. Is this an area where cooperation would be useful and, if so, how should this be pursued?

Discussion summary:

Cooperation in Indicator Development

The federal approach to development of indicators involves a number of steps including: establishing a network of people

developing and using them; developing a framework for indicator research (if we had a comprehensive set of indicators what are the components that would be covered?); surveying the network to see what research is being done; and comparing the framework to what is being done to see what are the strengths and weaknesses in research.

Researchers in the federal SOE reporting program are working on parameters they feel to be most representative, but these will clearly be a subset of all possible parameters. However, they need a baseline for future referencing and monitoring. Once this approach has been well established in federal departments, the next step is to expand it to include first the provinces and then NGOs, ENGOs and academics.

Five-year national reports will be refined through experience. Each province might be able to adopt core indicators from the national SOE reports and supplement these with indicators more suited to its own urgent issues.

For credibility, it would be worthwhile to develop some common indicators across jurisdictions, but we recognize that some jurisdictions have to develop their own indicators to meet their own needs.

There is a need for cooperation between people doing research and those collecting data. The Atlantic provinces are interested in research into indicators but have neither the time nor the resources to do their own research. They need to cooperate with a group doing research to have their data assessed.

We envisage two kinds of indicators: those that come from data that we already have and those from data not yet collected -- a new parameter. As we develop SOE reporting we will be able to identify needs for new indicators and find out ways to collect the data needed.

An "ecosystem approach" should be the premise for the development of environmental indicators. No one biological indicator species, however narrow its tolerance, will always be sufficient. There will continue to be a role for water quality data, for example. The science of bio-indicators is very young; the focus varies from a single species to nutrient cycling models etc.

The selection of indicators should not be left to scientists alone, but should involve the public, NGOs and others.

COMMUNICATIONS

The question posed was:

. Should we be coordinating our communications and marketing efforts for SOE reporting, and if so how should this be done?

Discussion summary:

Coordinating Communications and Marketing

We should ensure that the overall SOE message is the same at all levels. It is important to share knowledge and experiences. The national communications package for the 1991 report will be shared with the provinces, to help them learn from the federal experience.

Information should be as accessible as possible to the public. The OECD has suggested publishing reports in paperback form through a commercial publishing house, thus making it readily accessible to the public.

We need more dollars and other resources. Coordination with the various levels of government could decrease costs.

Joint funding is appropriate for promotion of SOE reporting. This could include 30-second commercials to increase the public's awareness of SOE reporting; perhaps a video on the topic could be produced.

More comprehensive mailing lists and media contact lists should be developed. Federal ministries should have provincial contacts because often information that is released federally can have regional relevance and can get local coverage as well as national.

We must recognize that perceptions and cultural values are subjective. The OECD coordinated a survey that came up with a subjective view of the state of the environment, which could complement an objective SOE report. The media like these kinds of reports, too.

In recognizing cultural perspectives, we must include the native viewpoint. Native people look several generations into the future; also, native people use the natural environment to a greater extent than the non-native population -- to them, it is not a luxury, it is a necessity.

ACTIONS REQUIRED: WHEN AND BY WHOM

Questions asked were:

. Is there a role for the Canadian Council of Ministers of Environment (CCME) or some other national group in harmonizing SOE reporting? If so, who, and what should its role be?

. Is there a need for agreements between governments for SOE reporting?

. Is there a role for government accords?

. Are any particular funding arrangements necessary?

. Based on the previous presentations and discussions, what action plan can be recommended or what steps can next be taken to move SOE reporting forward in this country?

A summary of discussion in relation to these questions follows.

Role for the CCME or an Alternative

There appears to be no existing national body adequate to coordinate SOE reporting -- present national councils are only sector based.

There is definitely a role for a senior group to advise and monitor what is going on in SOE reporting and to develop policy. There are immense benefits to a meeting like this. The usefulness of a formalized group may be restricted; it might be better to rely on a variety of working groups.

The CCME is interested in SOE; they would like to play a role. Its perspective is a bit narrow (being only Environment Ministers, not all resource ministers), but CCME could play the necessary coordinating role among provinces. We are concerned about giving too much importance to CCME because it does not deal with all aspects of the environment. Its mandate is quite specific. SOE requires a great deal of integration.

There is also a role for CCME as one channel of communication for establishing federal and provincial roles and relationships. Once this is agreed, much can be done to develop more specific agreements. CCME would not determine the policies, approach or scope of SOE reporting, but would facilitate federal-provincial communication.

Within CCME, SOE is a planning tool of which research is just one component. SOE should not be dominated by the research committee of CCME. Rather, it should be covered by the policy and planning subcommittee as an interim measure until a better vehicle can be found. Eventually, CCME should set up a new committee, created by its Management Committee and reporting to deputy ministers.

What is needed is a national SOE working group with a secretariat from Environment Canada and Statistics Canada. This would need high-level endorsement or approval, perhaps in the form of letters between ministers. Ministers can capitalize on the

fact that SOE reporting is an attractive package to the public.

Is there a role for the Round Tables on Environment and Economy? CCME has a limited focus with a bias toward the traditional resource sector. However, not all Round Tables will be looking at SOE reporting. This reflects in some ways whether SOE is universally seen as an underpinning for sustainable development. Also the Round Tables may have varied amounts of dollars and person-years available. Furthermore they have little legal status (and, therefore, authority). They should, none the less, be kept apprised of the evolving process and encouraged to give feedback; they should be brought into the process early on by inviting secretariats to attend the next national SOE working group.

Pros and Cons of Agreements Between Governments

Formal agreements make resources more accessible. Many jurisdictions cannot spend money on something without a signed agreement. Agreements are especially useful to deal with spatial frameworks (if we want to take an ecosystem approach), databases, the exchange of information and the funding of consultants and NGOs.

Agreements are options if the CCME route does not work. Even with CCME we may need agreements between provinces on sharing resources, and between provincial and federal governments on exchanging information, especially with Statistics Canada.

Agreements would help to standardize data, avoid repetition, share resources etc. and provide a commonality so that provincial reports could come together into a national report.

There are significant federal-provincial mechanisms already in place for cooperation. There are many federal-provincial data collection programs. Where there are already agreements, we should use them. We need flexibility; the approach will be dictated by the issue that is important.

Current agreements are not without problems, including a lack of uniformity in agreement coverage across the country. For instance, many agreements do not have SOE as part of their mandates, so how do we incorporate them? Again, some regions have not accepted the federal program on SOE; the answer to this problem is to not ask those jurisdictions to do the work, but to honour the communications, organization and expertise structures that these agreements represent.

Current agreements can be supplemented by greater use of informal networks. We should get together more often, perhaps next year to share what happened over the year. Other possible approaches are memos of understanding, accords and funding arrangements.

Do we need to adopt a structure to guide the SOE reporting process before action can be taken? Perhaps the first requirement is for data organizing processes. Or are these questions premature? Indeed, there may be a need to hold back on structural decisions. Some provinces have embarked on courses of action to which they may be tied. Such a range of diverse approaches may have strength in that it promotes yet more learning by doing.

A Role for Environmental Accords

These could be substituted for a national program in the absence of CCME endorsement, but if CCME gets together on this, that's all the direction we'll need. If we don't go with CCME, we can see how the Canadian Environmental Protection Act (CEPA) shapes up.

Accords are usually between the federal government and individual provinces and would not be truly national. In general, an accord wouldn't hurt and would be necessary if major legislative changes were needed.

As issue-specific SOE reporting themes are identified, accords could be struck between provincial and federal governments. This is one way to establish a long-term institutional commitment to the whole process of SOE reporting, particularly with respect to resourcing.

There is some debate about harmonizing indicators. To do so would need a more formal structure, such as an accord or through the CCME, with a federal-provincial team of specialists. There is concern that an accord might be too restrictive; that it would not be flexible enough to change indicators as needed.

The Need for Specific Funding Arrangements

Funds are needed to complete databases and ensure their consistency and to involve NGOs (for example, intervener funding for review and consultation).

Such arrangements also are needed where funding requirements go beyond the annual budget of a jurisdiction, or where one jurisdiction wants SOE information from another.

Funding arrangements would help to maintain the consistency and completeness of data.

RECOMMENDED ACTIONS

Working Group One

Working groups on specific subjects should be established in the next 12 months. Subjects considered should include data collection and evaluation, indicators and marketing. The leaders of the group should have some experience.

We should develop a generic information package, including advertisements and possibly a video, that publicizes SOE reporting.

Working Group Two

British Columbia and Environment Canada should approach CCME jointly on SOE; the next step is to initiate action by CCME.

Follow-up workshops should take place within six months on integrated databases, exchanges of information, information gaps and data needs and further action plans.

An annual workshop would enhance the exchange of information among jurisdictions, assist in planning and implementing the promotion of SOE concepts by provincial, territorial and federal governments and help the development of programs and agreements.

A network of participating officials would continue and strengthen the role of the federal SOE communications network (newsletter and mailings), support new initiatives in exchanging SOE information among jurisdictions and ensure that information circulates freely, not just at annual workshops.

Working Group Three

At the policy level, formalize the process at senior government levels to facilitate funding, cooperation and inter-agency work. Also incorporate other stakeholders. This approach is epitomized in the indicator strategy of the federal government; we start with the government and then go on to the other stakeholders -- industry, NGOs, ENGOs and consumers.

At the operational level, hold a workshop next year, set up a mechanism for information exchange between the different levels of government through a national working group on SOE. This group should be charged with the responsibility of setting up a secretariat for this purpose. The national working group has a committee of regional executives (CORE) that is supposed to do this, and it works well in some regions. CORE should be explicitly given the task of facilitating information sharing. There is room for such a secretariat role at headquarters.

Working Group Four

A national SOE working group should be formed with a secretariat provided by Statistics Canada and Environment Canada and hold quarterly meetings.

Each jurisdiction should set up a process to keep its own Sustainable Development Round Table informed and involved and provide a vehicle for its input.

Members of the provincial and national Round Table secretariats should be invited to the next national SOE working group meeting.

VI WORKSHOP CONCLUSIONS; FUTURE DIRECTIONS

The final plenary session focused on what should be the major components of an action plan in the short and long term. The following were identified as major points of apparent consensus.

Commitments

Environment Canada has agreed to facilitate feedback from the workshop in the immediate future.

British Columbia has agreed to table for comment with the CCME a summary of the proceedings from the present workshop and an outline of the group's proposed next steps. The covering letter and an executive summary will be circulated to provincial, territorial and federal representatives for their comments.

Format of Next Meeting

The next meeting or workshop in one year should be organized as a small meeting. Any expansion to other topics should be in small steps. The project should build slowly from the present group.

Members of the present group should remain involved as a first priority. Others that could be involved include the secretariats of Round Tables, members of the Canadian Environmental Advisory Research Council and the Economic Council of Canada, provincial statistics people and academics. New people should first be involved in task groups, from which representatives may be invited to the first day of the next meeting.

The next meeting can cover various indicator frameworks -- for particular contexts, for communications and marketing, for the evaluation of SOE reporting, for spatial frameworks and for data management; there might be a half day on development of an action plan that flags long-term resource needs.

Task groups where appropriate would provide material for the topics to be addressed.

Task Groups

Between now and the next annual meeting there should be a number of task groups constituted of those people who want to get together, including other interested government agencies not represented at this workshop. Topics for these groups could be indicators, communications, data management and mechanisms for cooperation.

The data management group should meet after there has been some progress on indicators and spatial frameworks.

Feedback

Participants should return home and provide feedback on evaluation of the structure and content of the present workshop, reactions to proposed next steps, priority needs of jurisdictions just starting on SOE reporting and willingness to host the next meeting.

APPENDIX

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